

Review for lab work













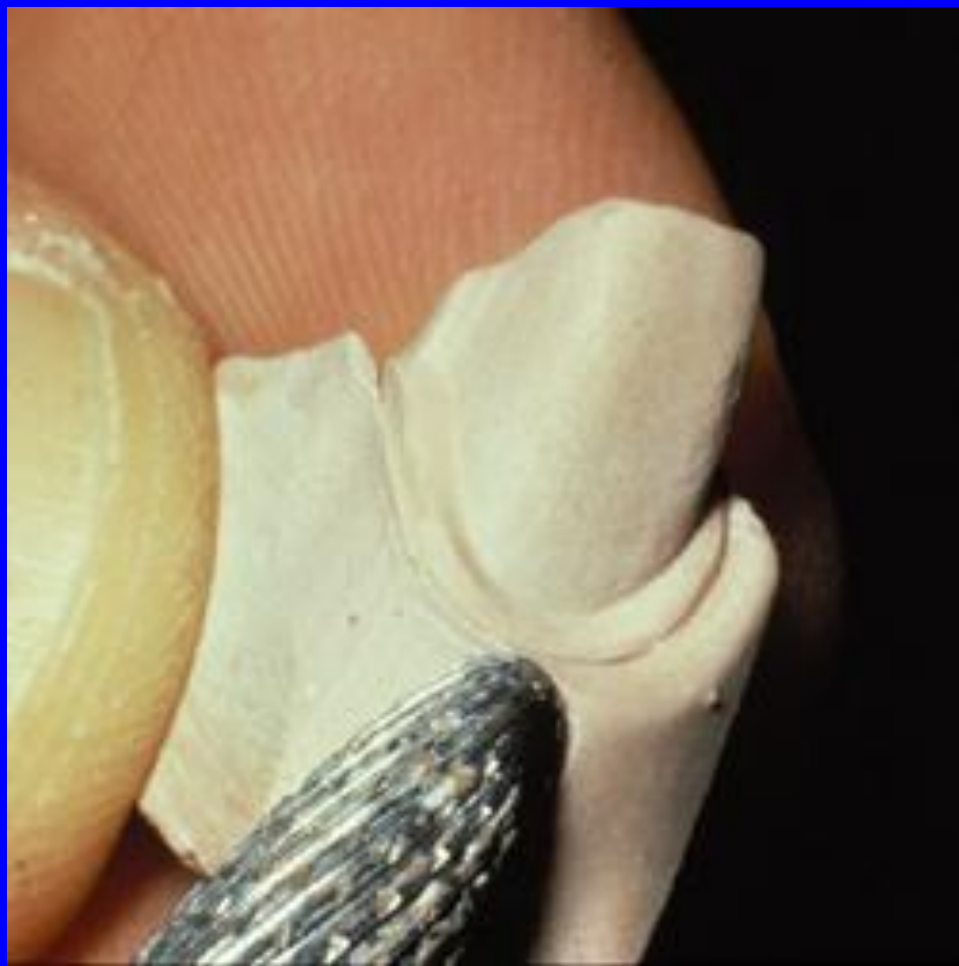






# working cast and die fabrication

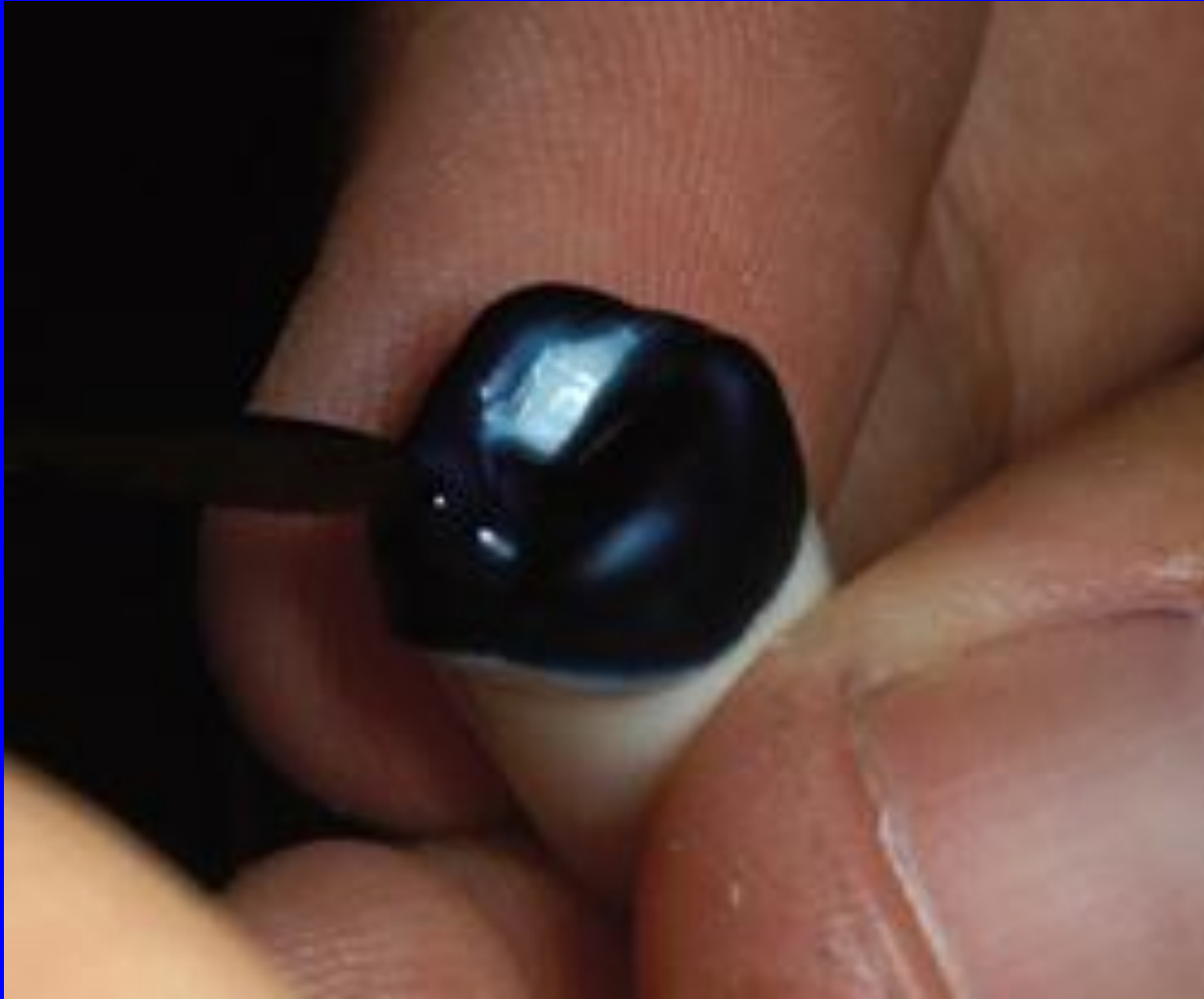








wax pattern





# Spruing



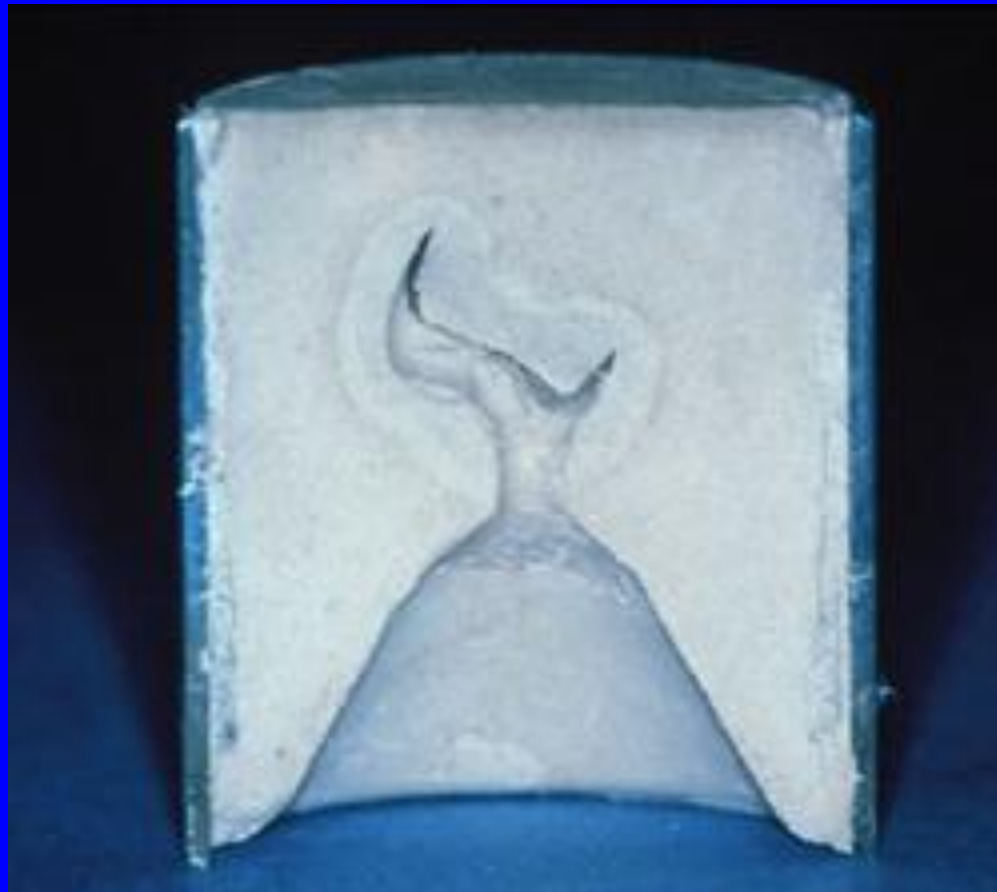




# Investing



# Wax elimination





# casting



# Coating



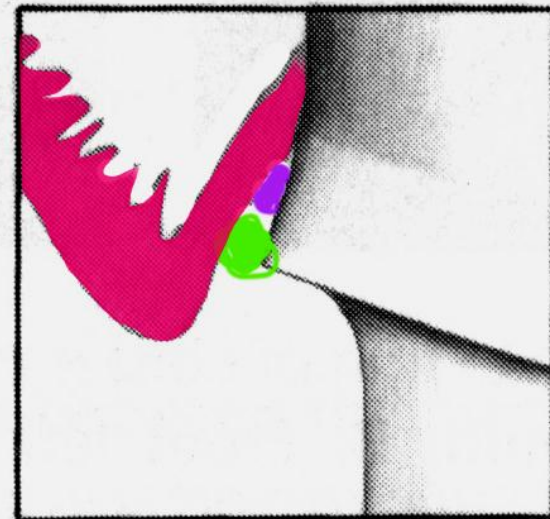
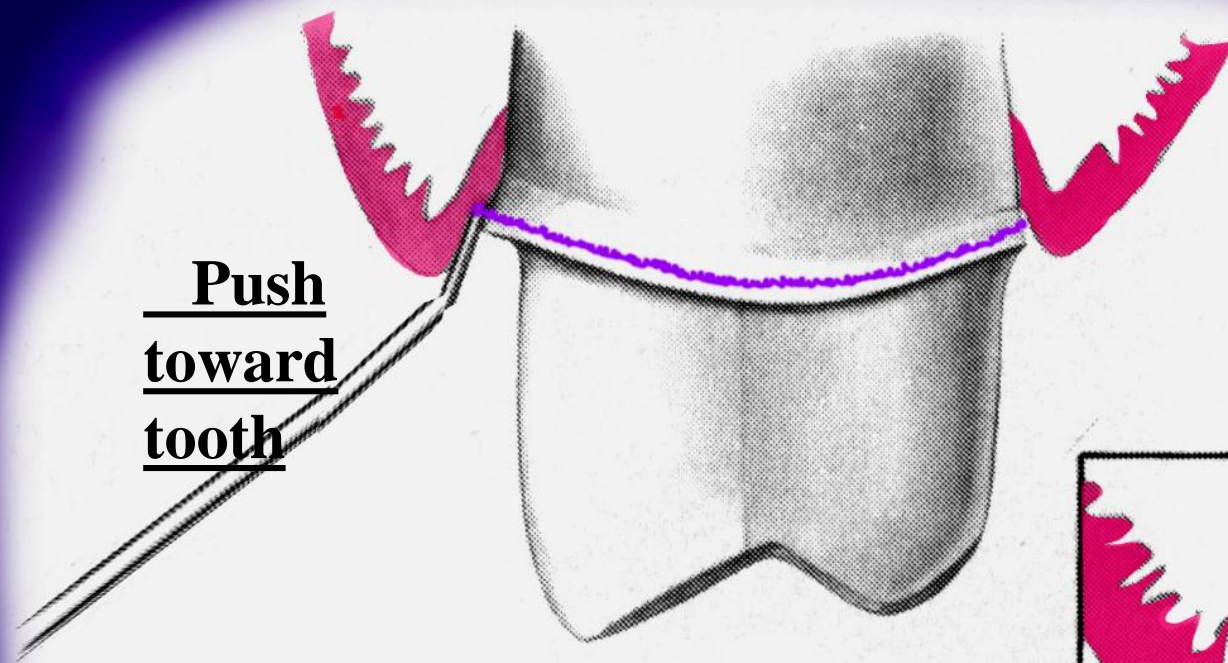




how to deal with ur lab ????

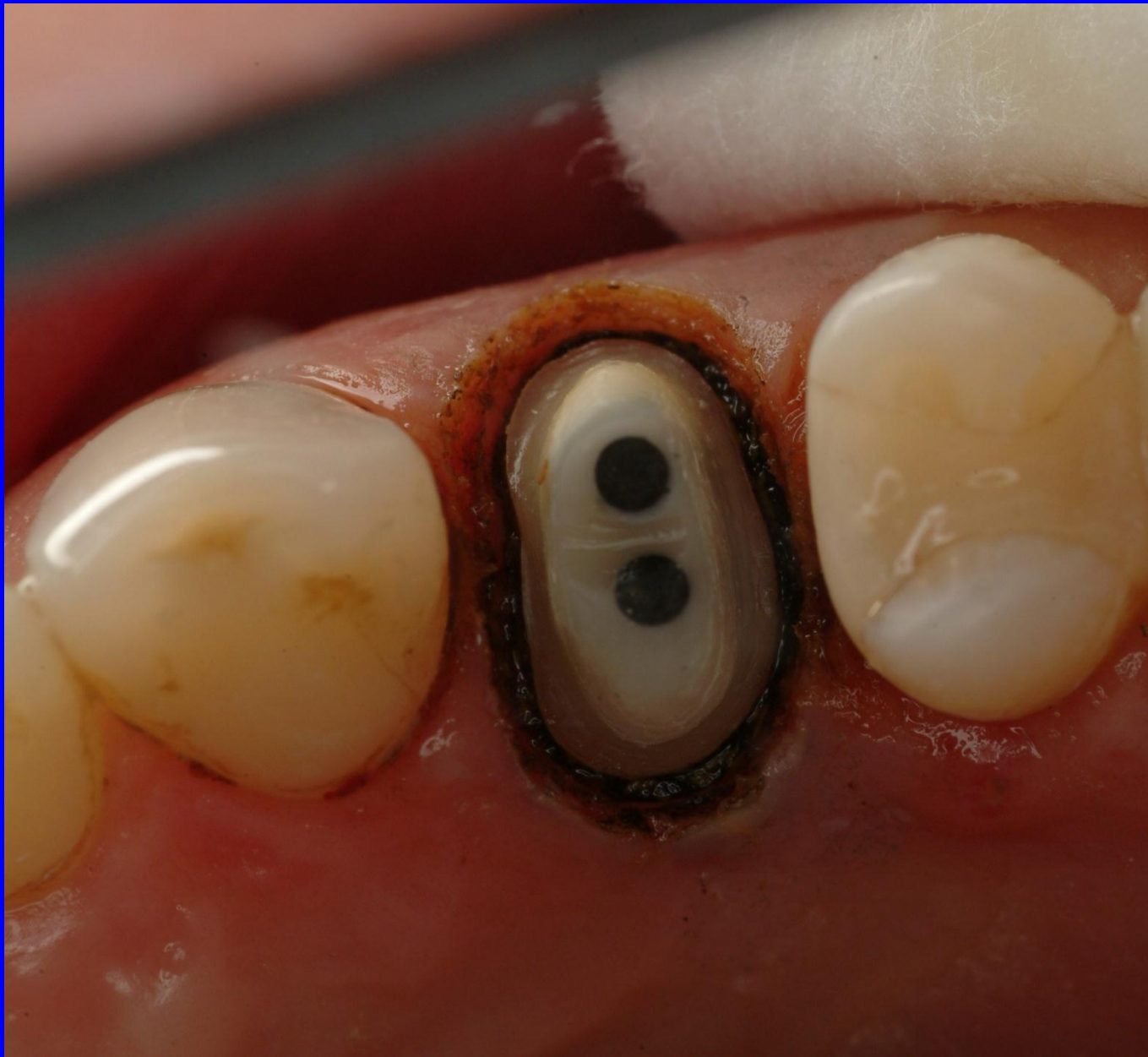














“double cord” gingival  
displacement









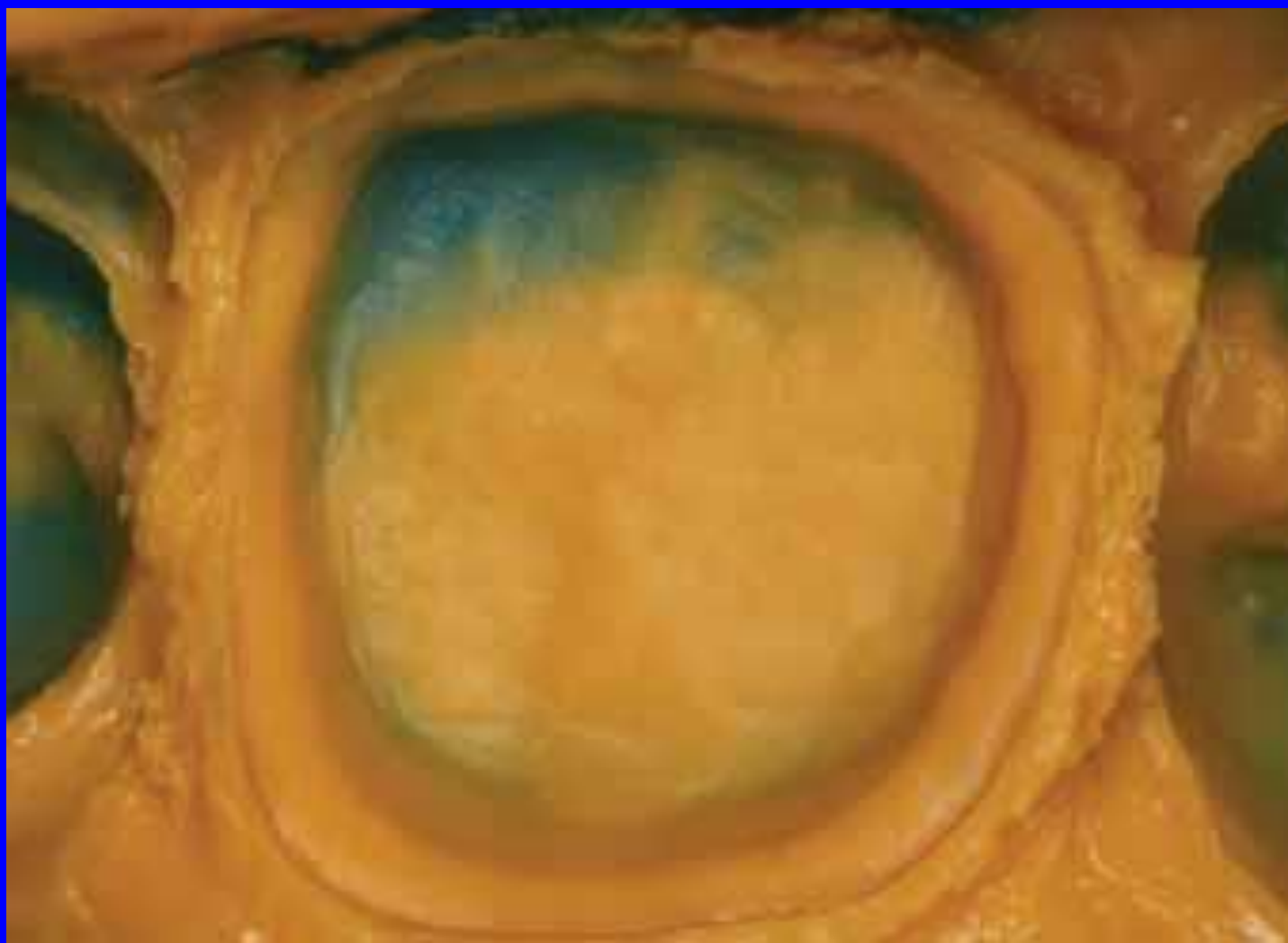












# The cordless gingival retraction













12:44

# Elasotmeric Impression material

# Classification according to chemistry

- Polysulphide
- Condensation silicon
- Polyether
- Addition silicon

# Classification according to viscosity

1-Putty

2-high

3-Medium

4-low

5- ultra low



# Polysulfide

- First dental elastomers
- Indications
  - complete denture
  - removable fixed partial denture
  - crown and bridge



# Advantages

- Lower cost
  - compared to silicones and polyether
- Long working time
- High tear strength
- High flexibility
- Good detail reproduction



# Disadvantages

- Poor dimensional stability
  - water by-product
  - pour within one hour
  - single pour
- Custom trays
- Messy
  - paste-paste mix
  - bad odor
  - may stain clothing
- Long setting time



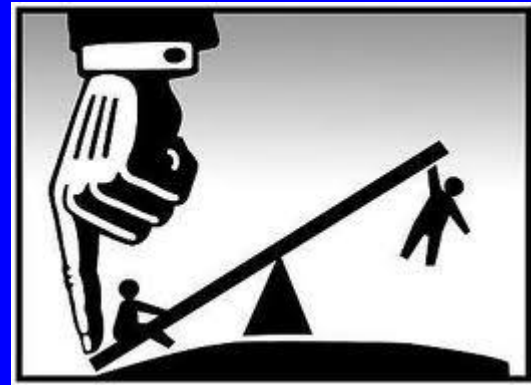
# Condensation Silicone

- Indications
  - complete dentures
  - crown and bridge



# Advantages

- Better elastic properties
- Clean, pleasant
- Stock tray
  - putty-wash
- Good working and setting time



# Disadvantages

- Poor dimensional stability
  - high shrinkage
    - evaporation of ethanol
  - pour immediately
    - within 30 minutes
- Hydrophobic
  - poor wettability





# Addition Silicones

- Vinyl polysiloxane
- Indications
  - crown and bridge
  - denture
  - bite registration



# Advantages

- Highly accurate
- High dimensional stability
  - pour up to one week
- Stock or custom trays
- Multiple casts
- Easy to mix
- Pleasant odor



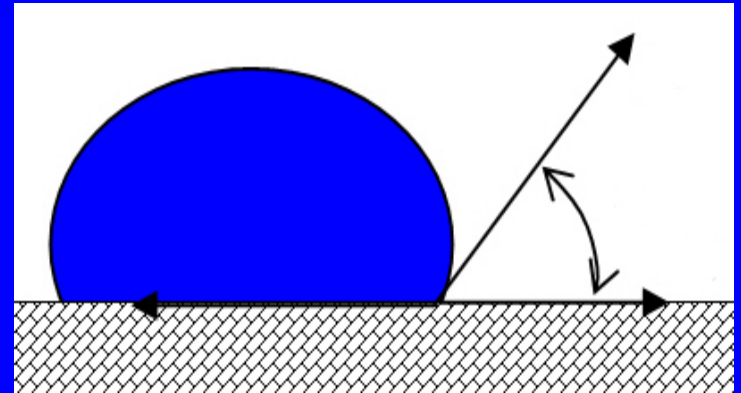
# Disadvantages

- Expensive
- Sulfur inhibits set
  - latex gloves
  - ferric and Al sulfate retraction solution
- Short working time
- Possible hydrogen gas release
  - bubbles on die
  - palladium added to absorb



# Addition Silicones

- Surfactants added
  - reduce contact angle
  - improved
    - castability



# Polye

- Indications
  - crown and bridge
  - bite registration



# Advantages

- Highly accurate
- Good dimensional stability
- custom or dual-arch trays
- Good surface detail
- Pour within one week
  - kept dry
- Multiple casts
- Good wettability





# Disadvantages

- Expensive
- Short working time
- Rigid
  - difficult to remove from undercuts
- Bitter taste
- Absorbs water
  - changes dimension

# Impression techniques

# Single mix technique

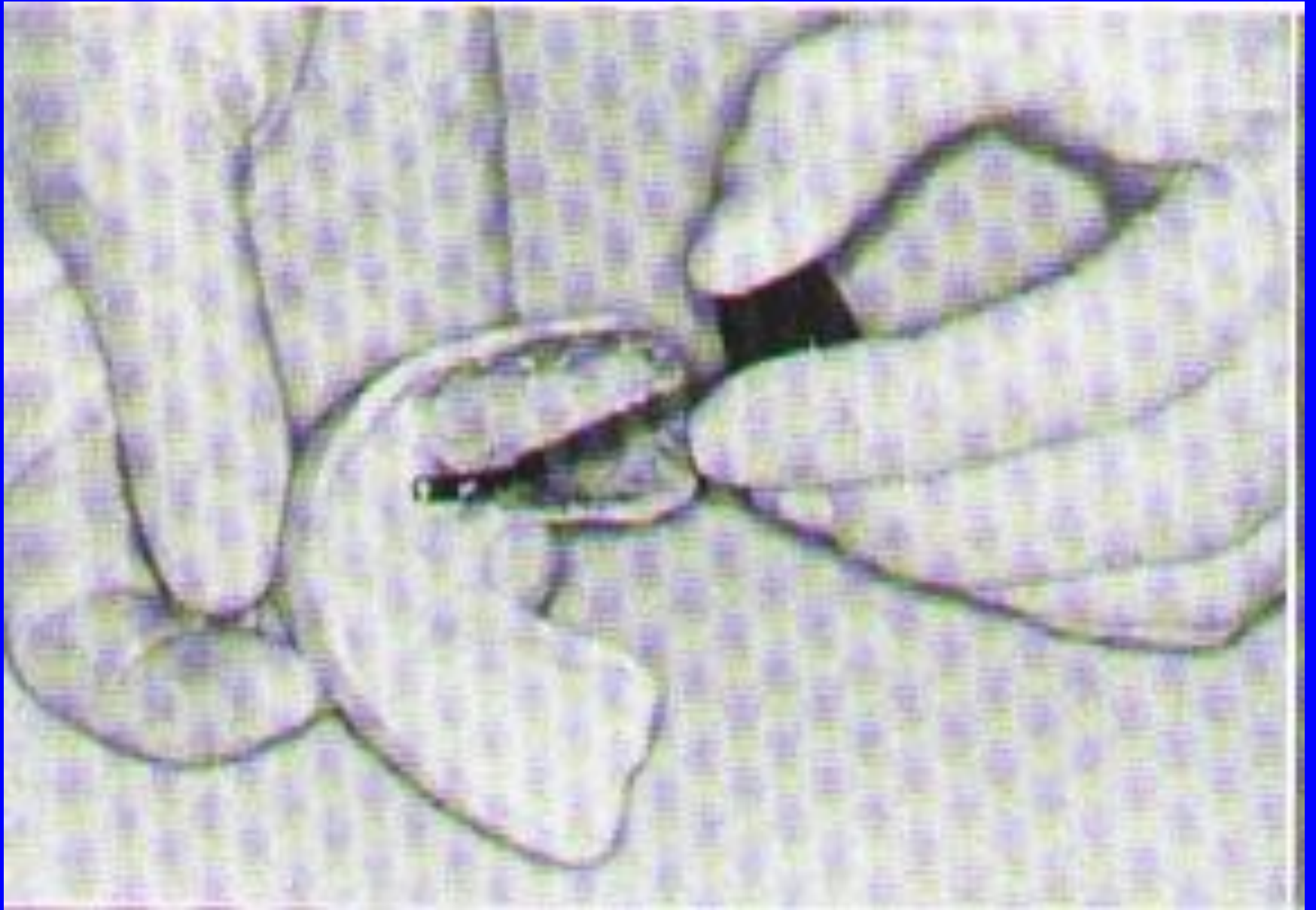
Monophase



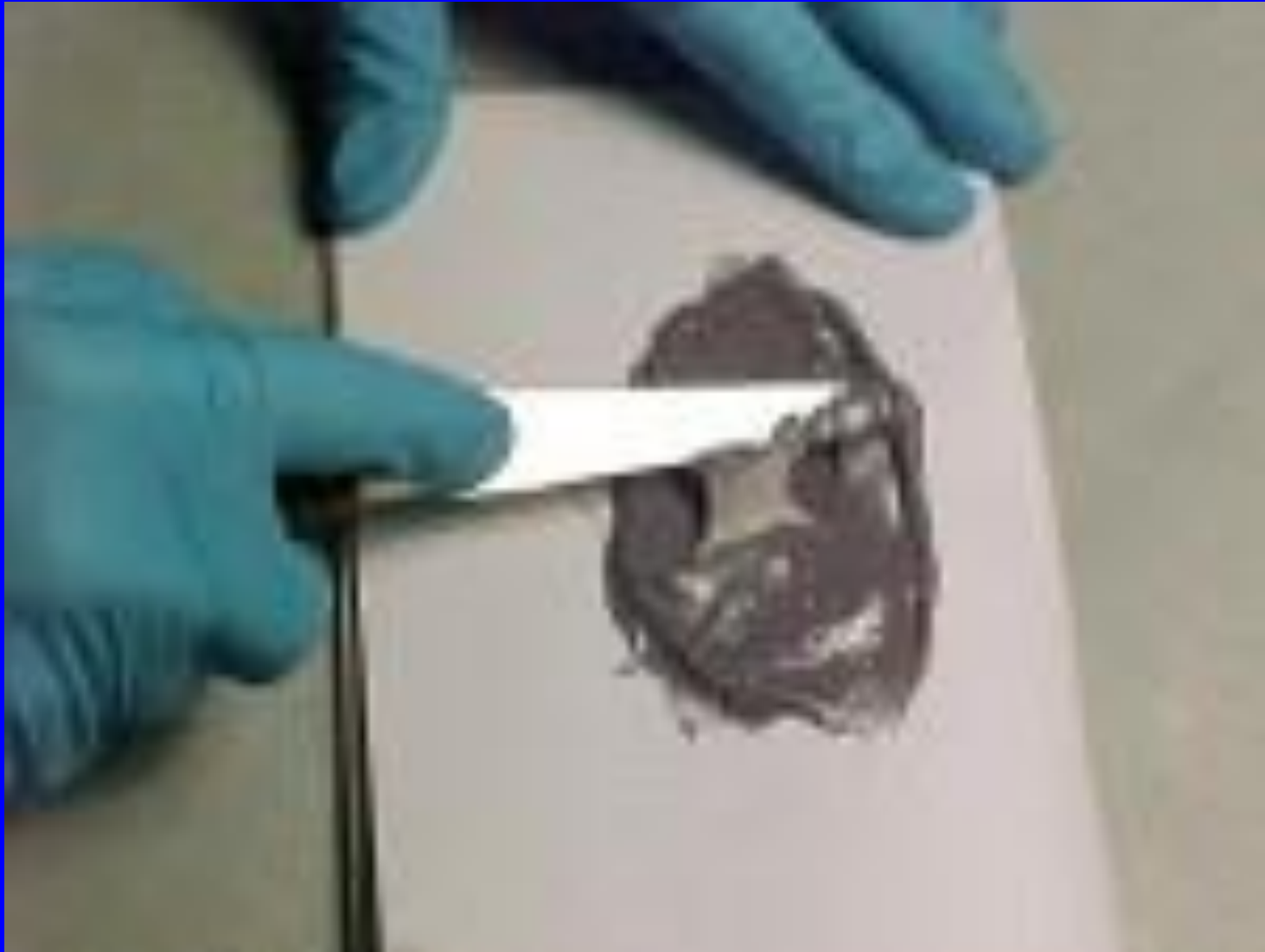


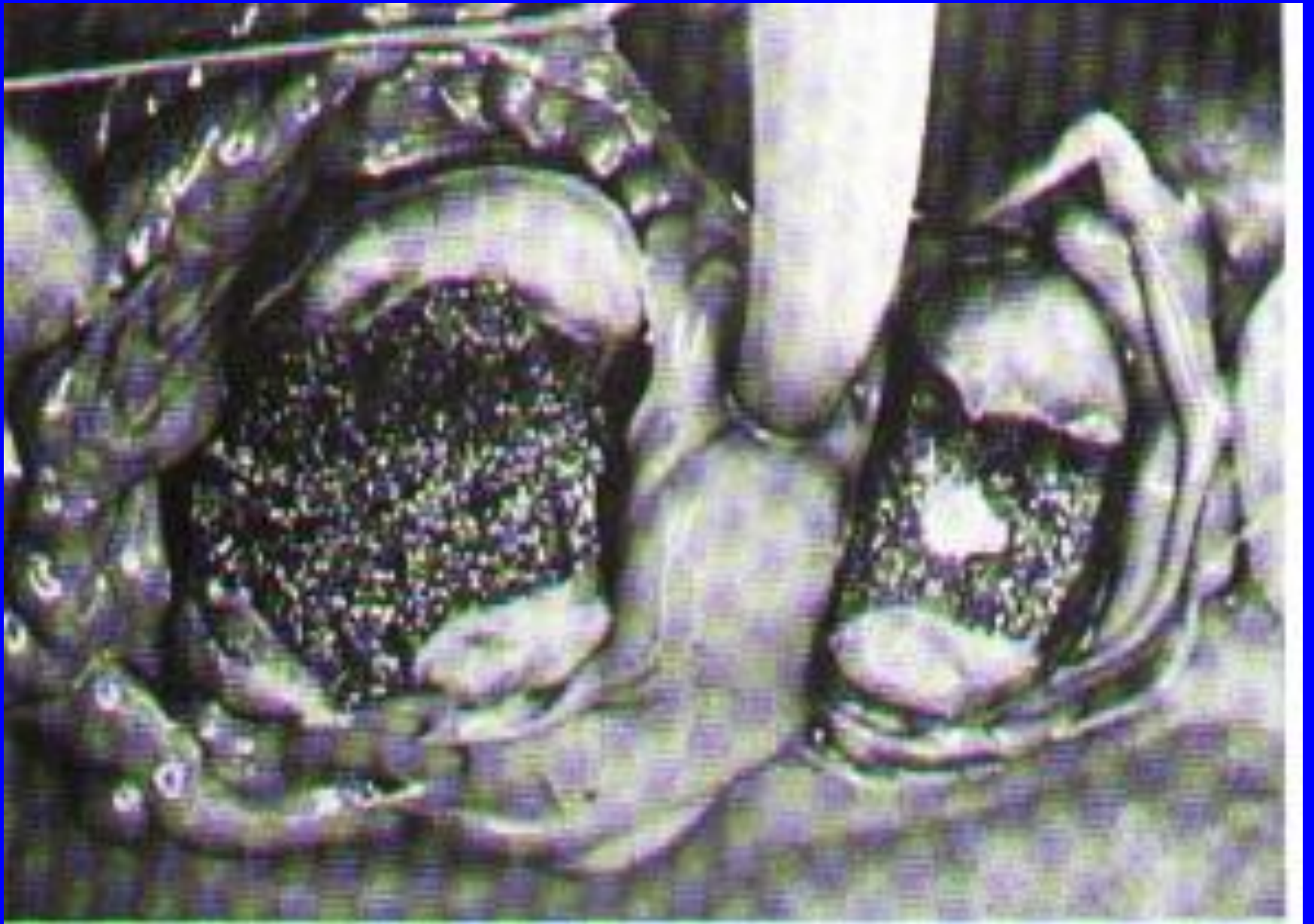
Caulk®  
Tray  
Adhesive  
14 mL

Printed in U.S.A.  
226155 (9-3) 1971











# Double Mix Impression Technique

one step

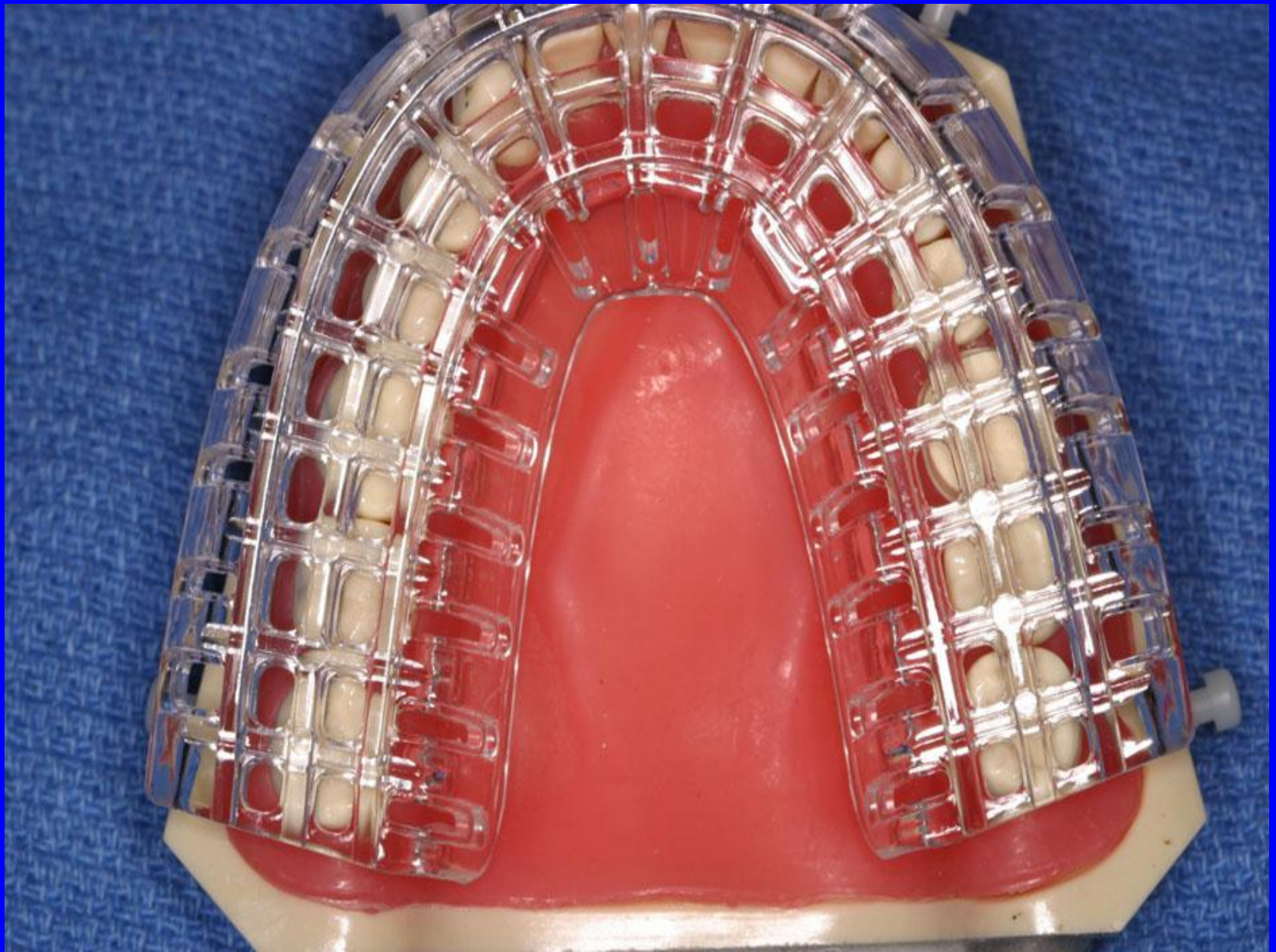










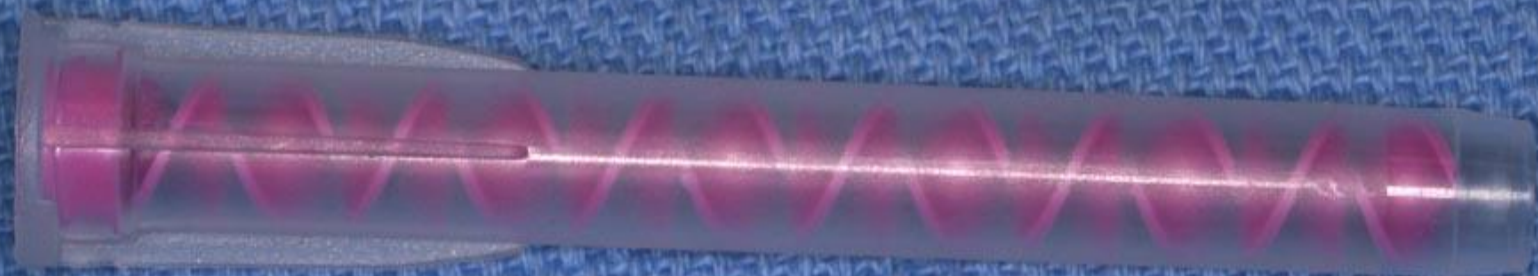






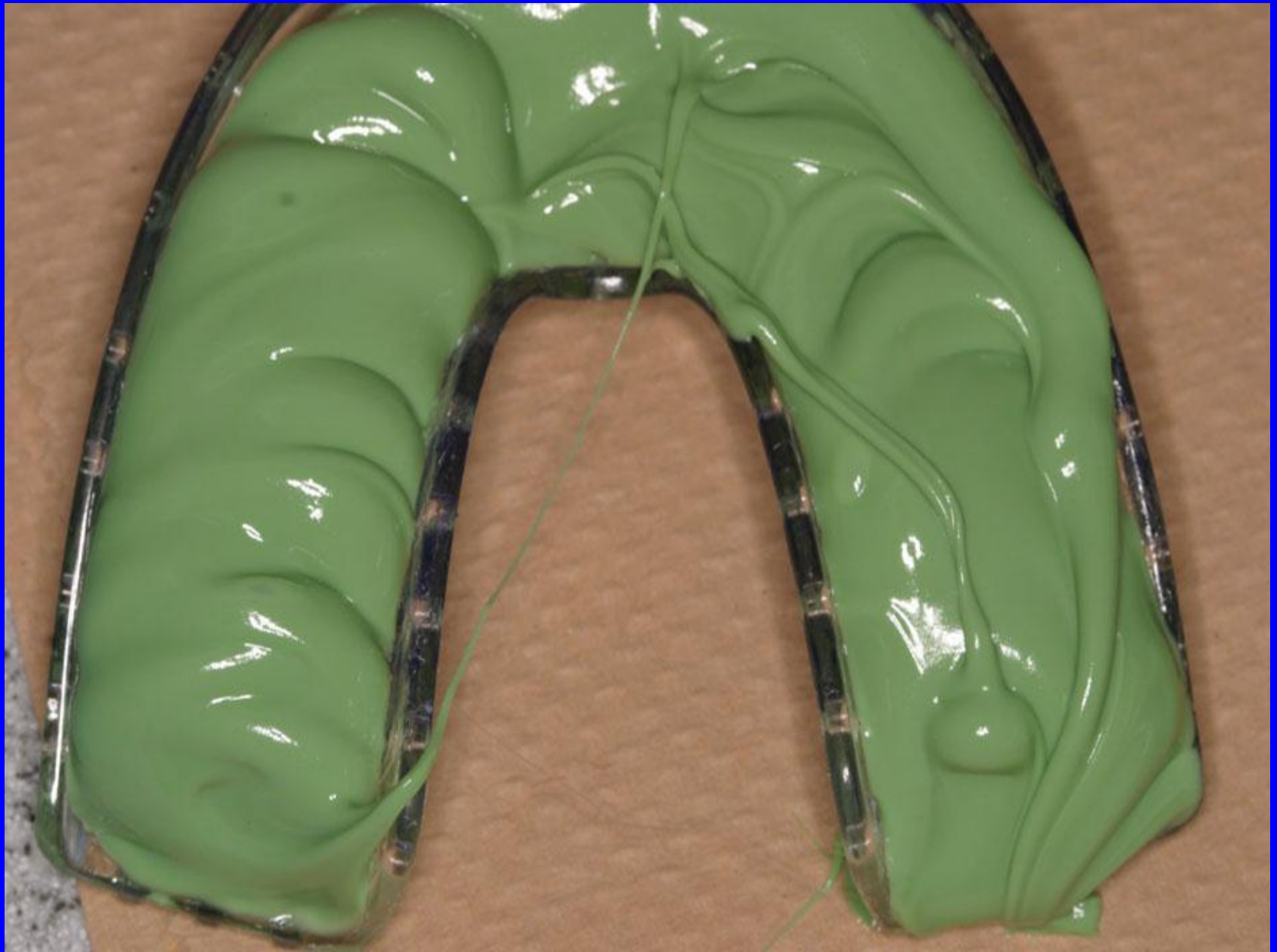














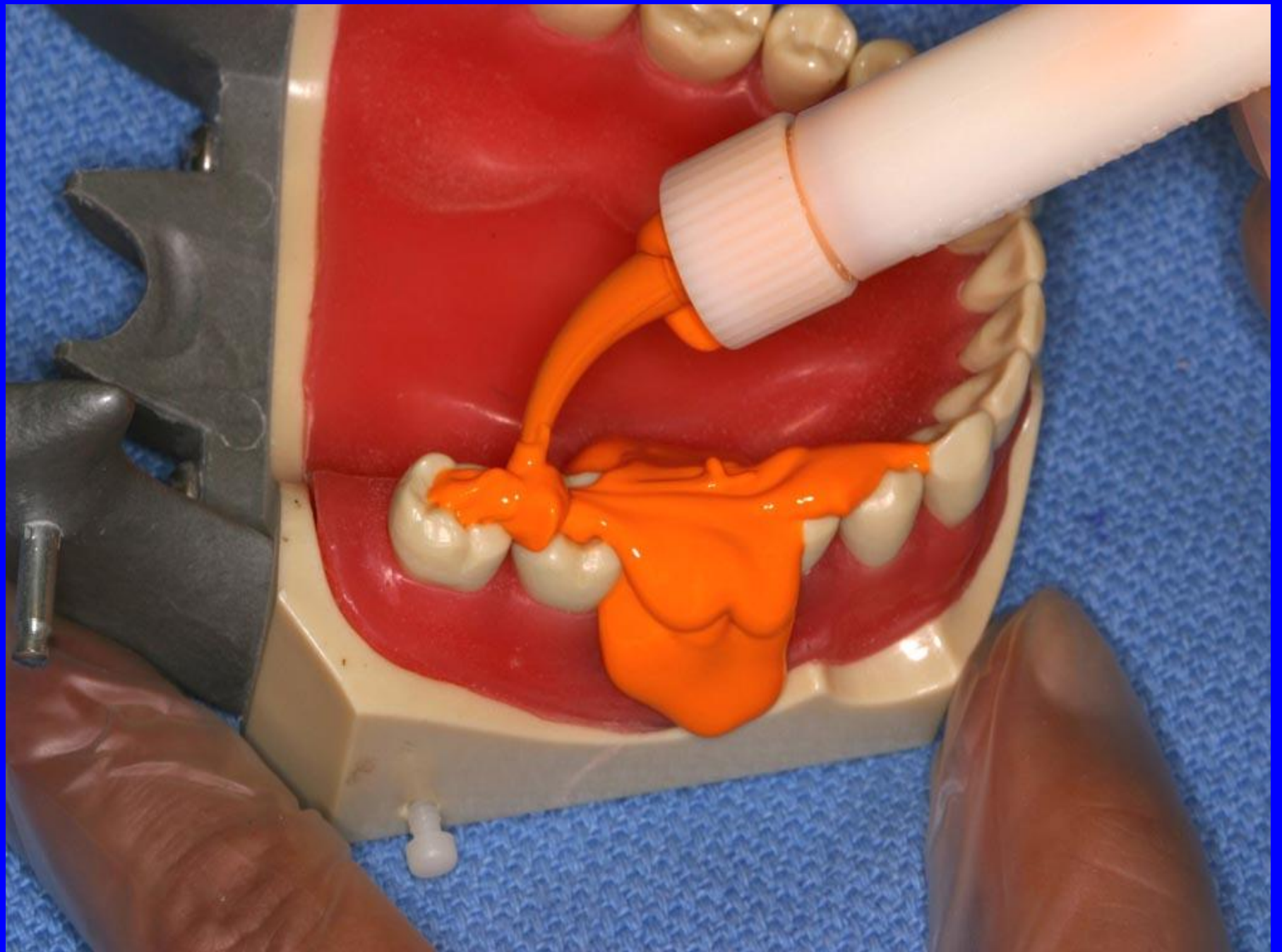




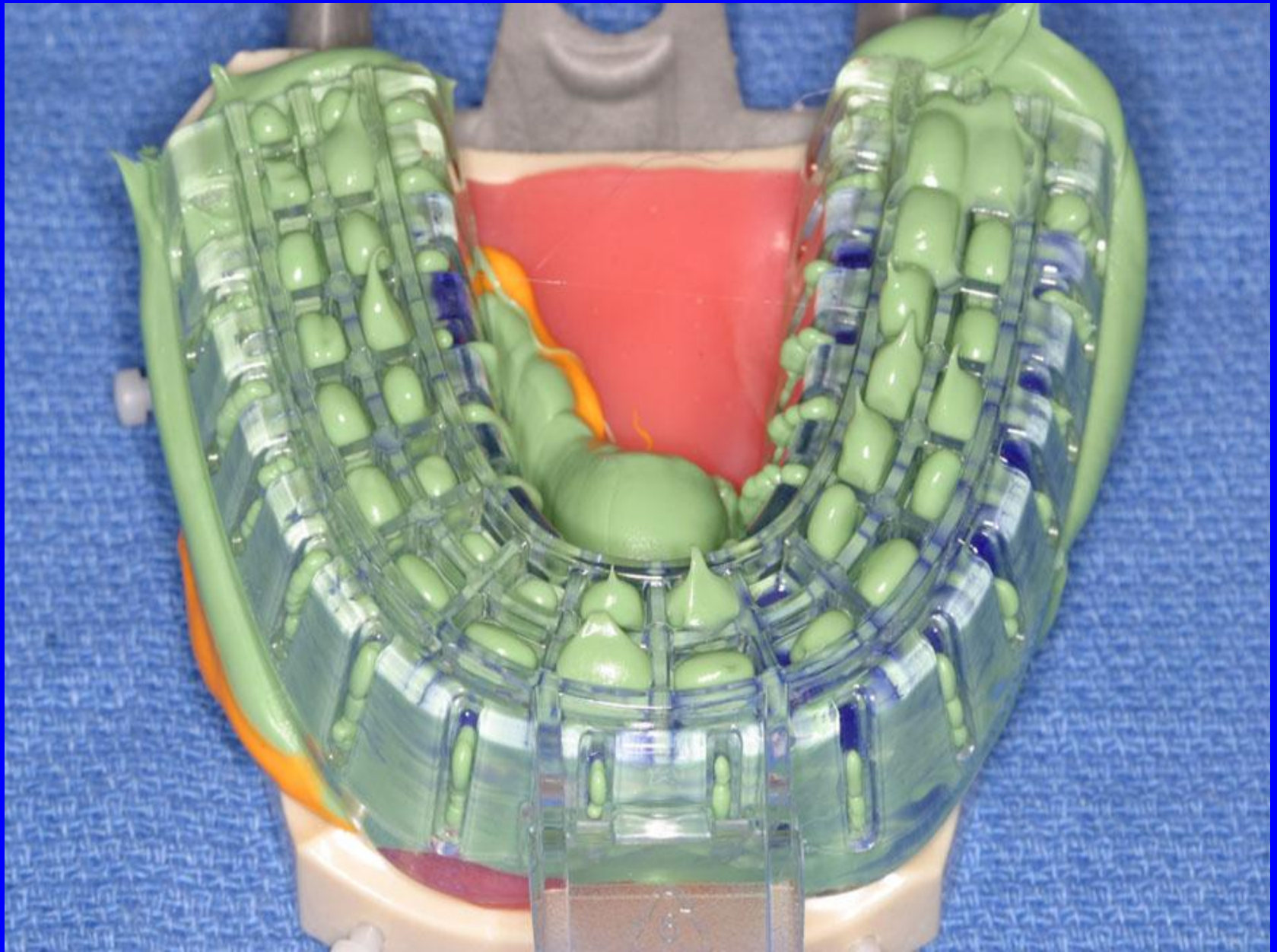
Keep tip of syringe in  
impression material when  
injecting





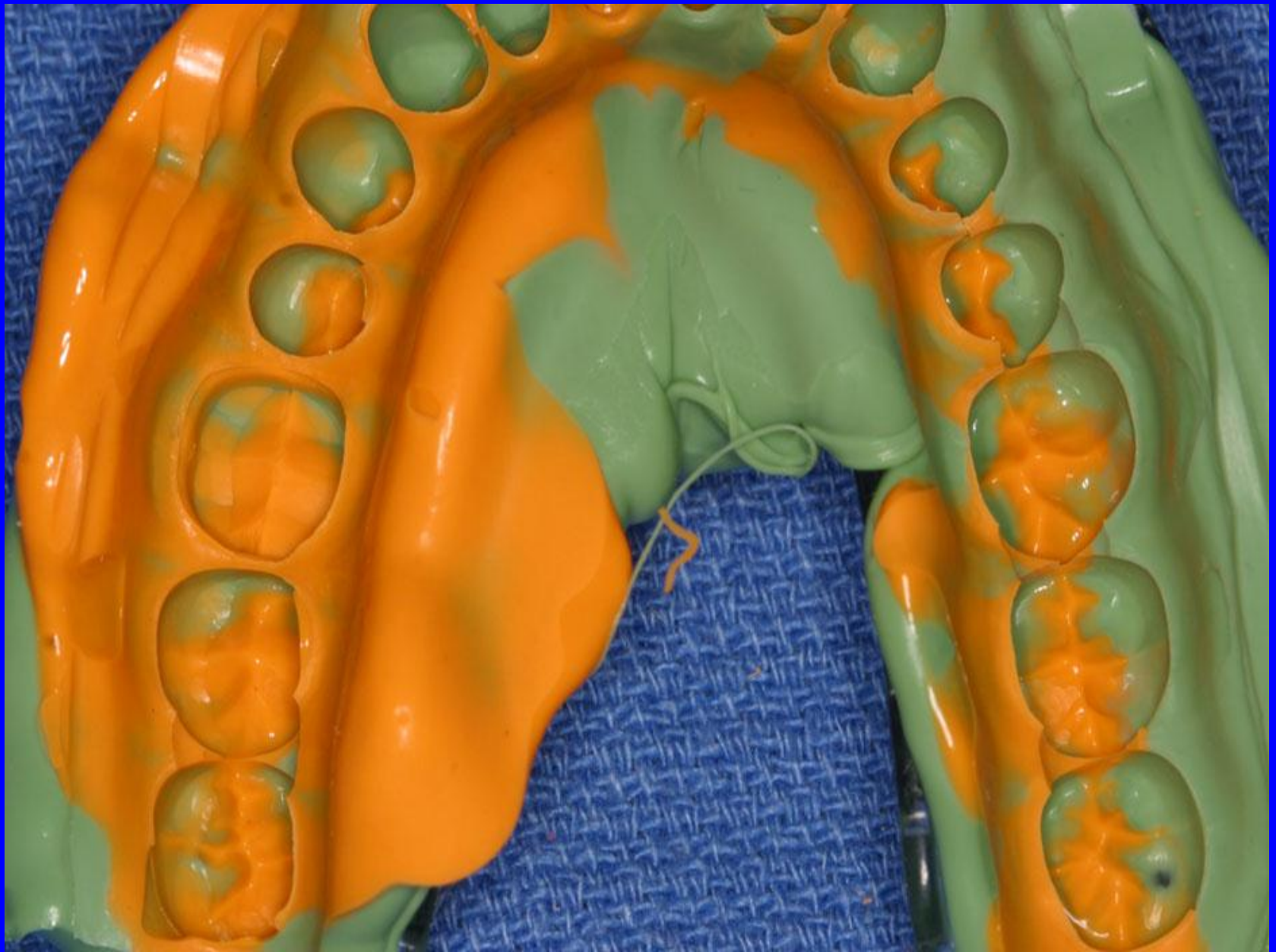








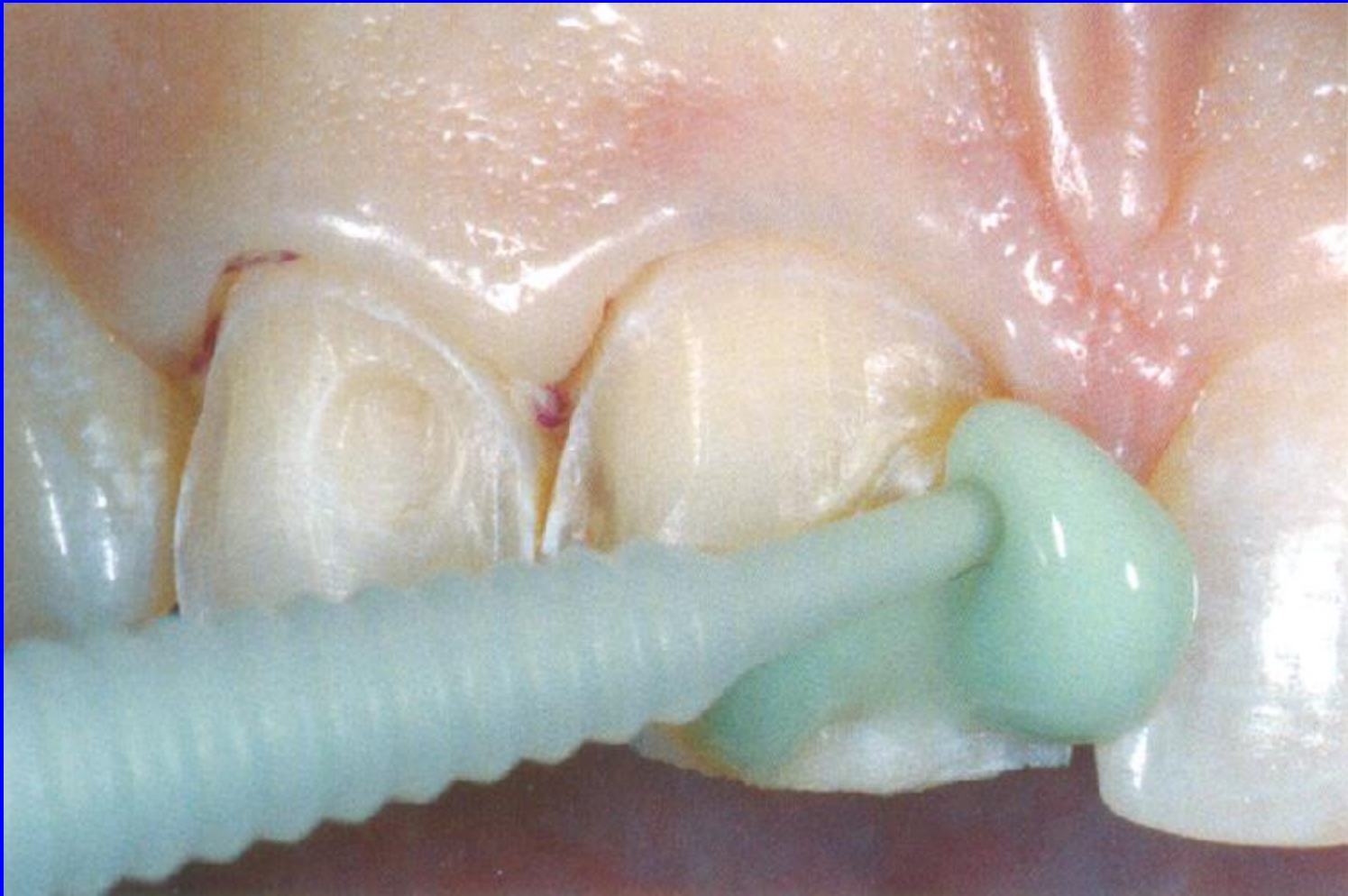
Impression must set for a  
minimum of 5 minutes from  
start of mix



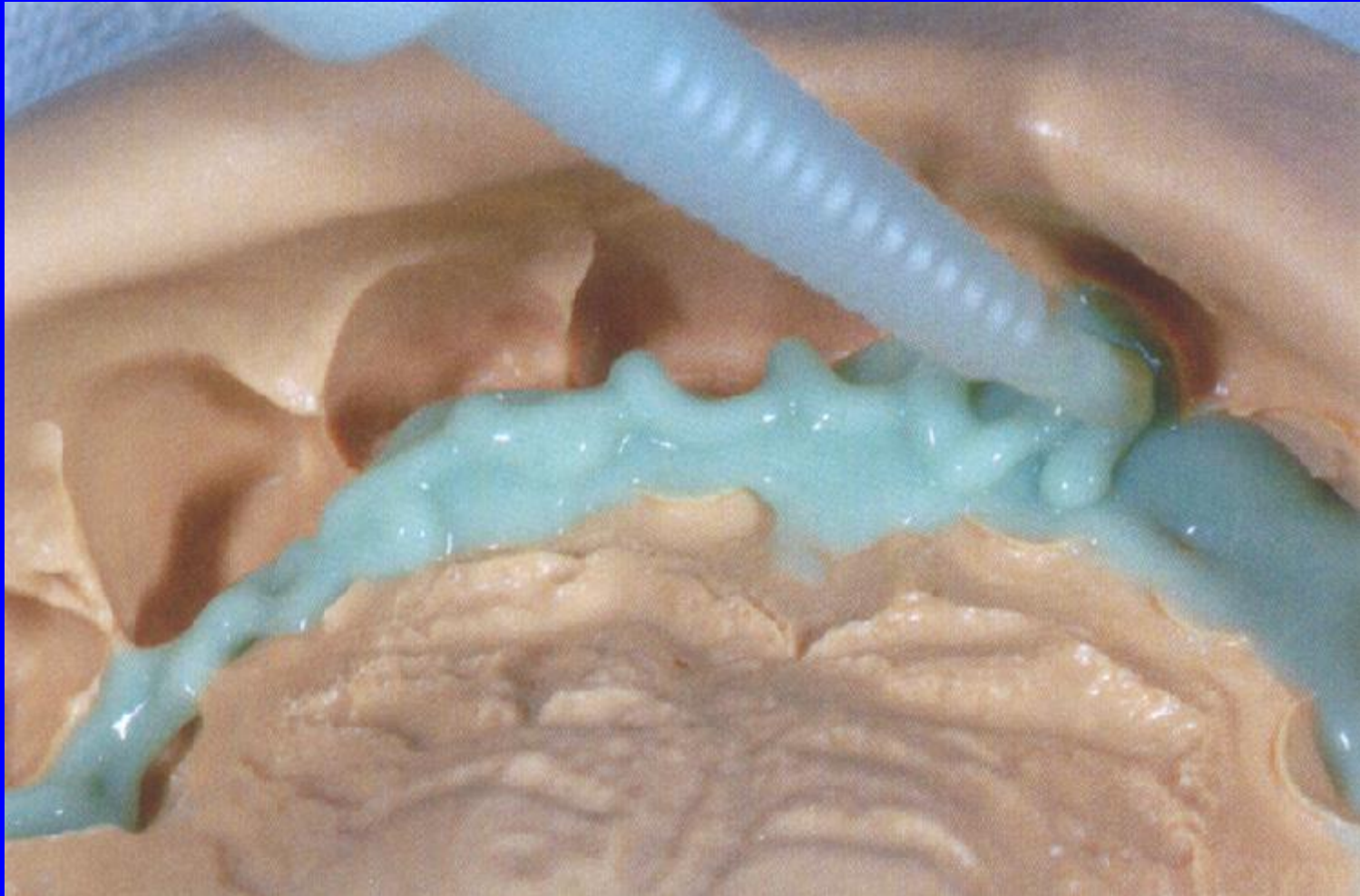
# Double mix Impression technique (putty wash) Two step







**Around prepared teeth**



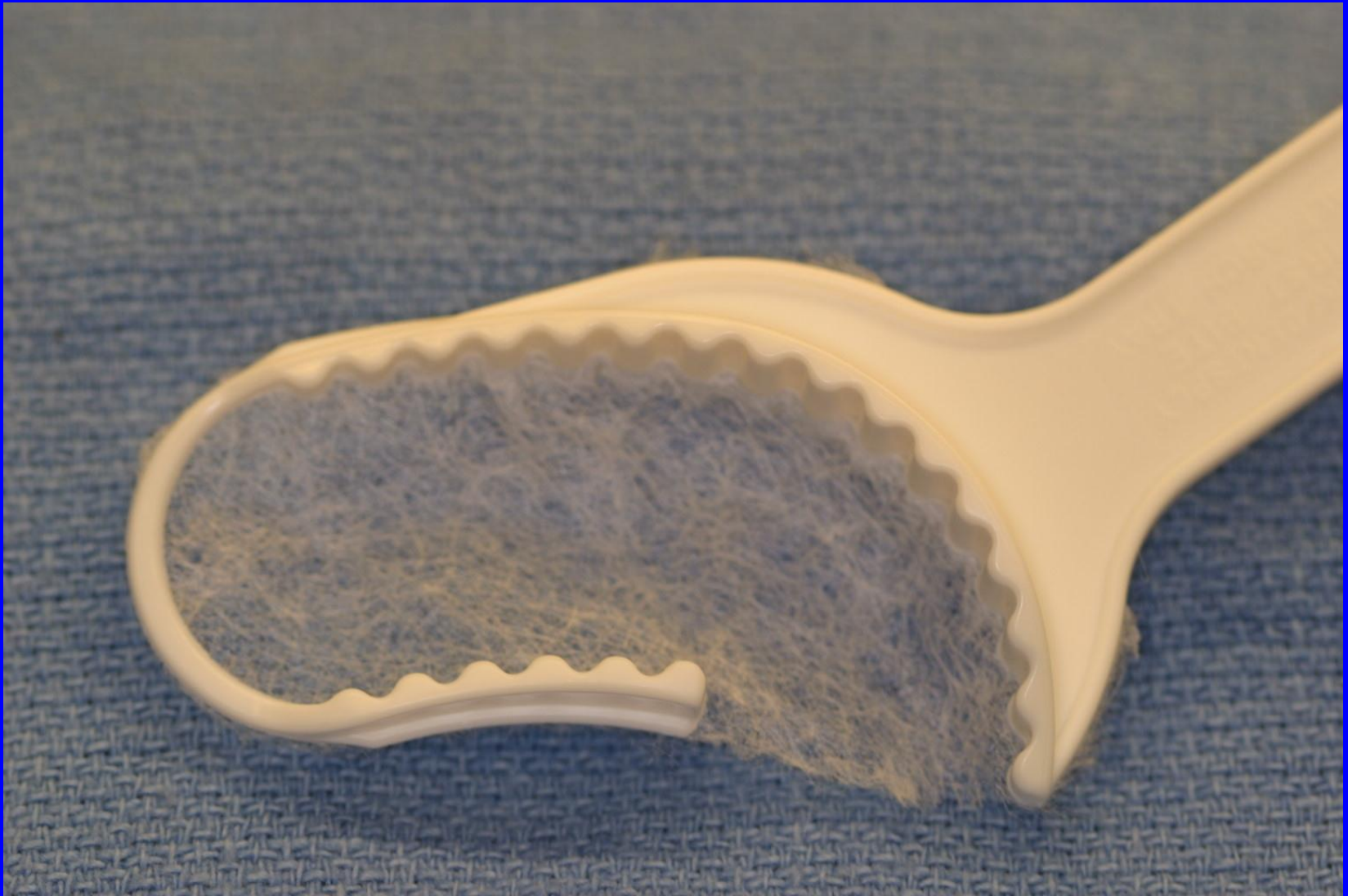
**Into the putty overall impression**



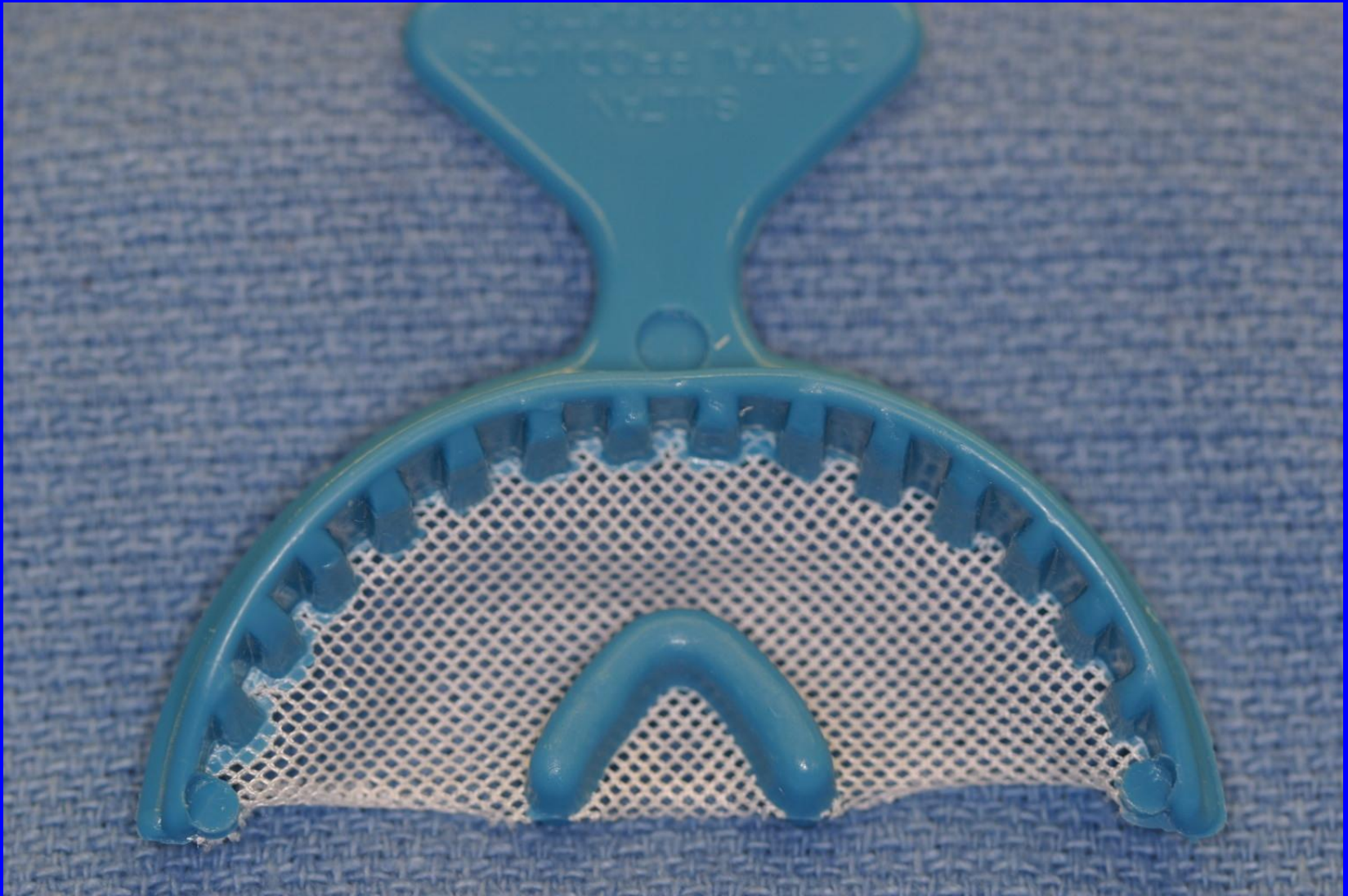


**Impression completed**

# Dual arch impression Technique









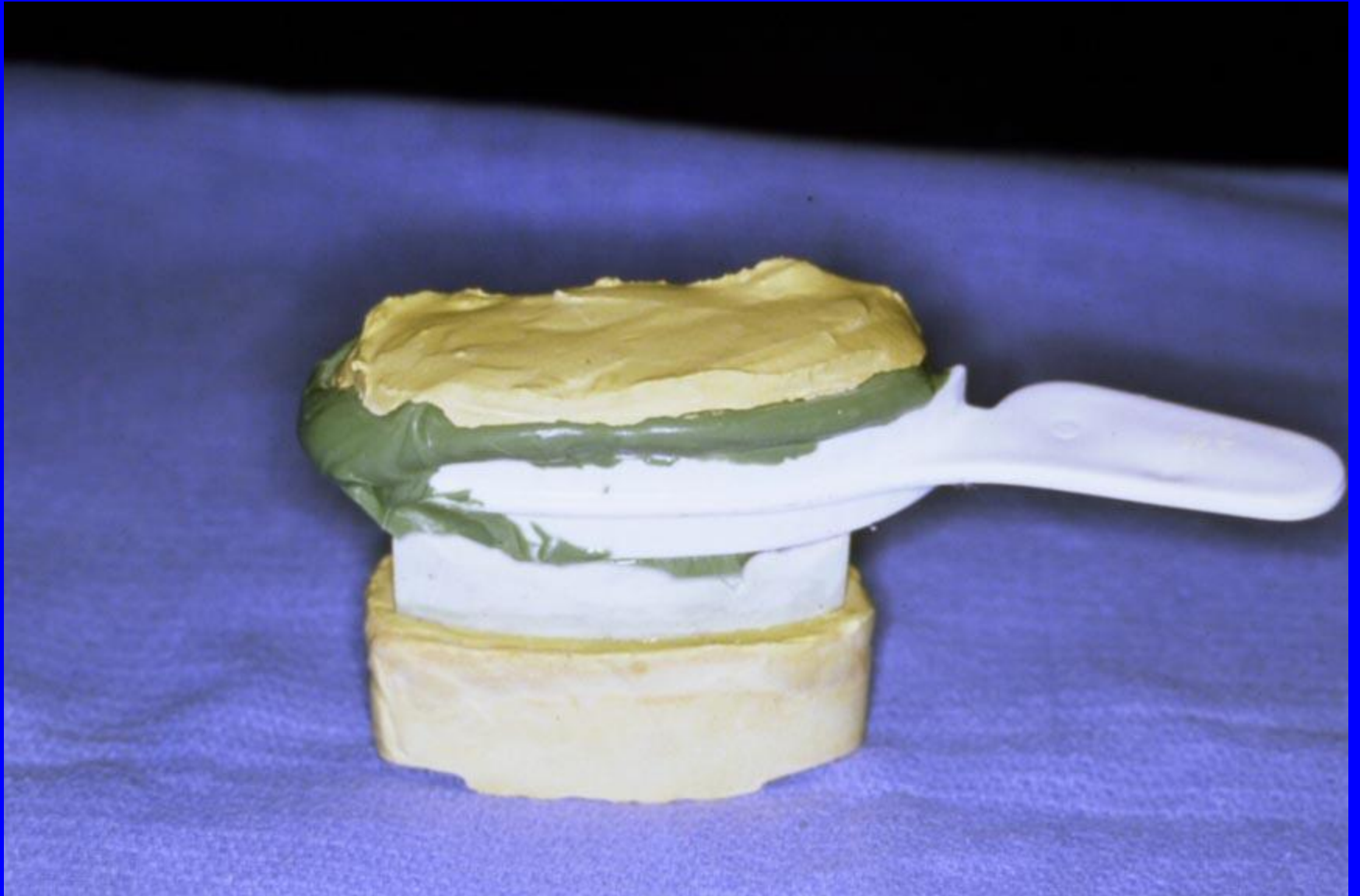


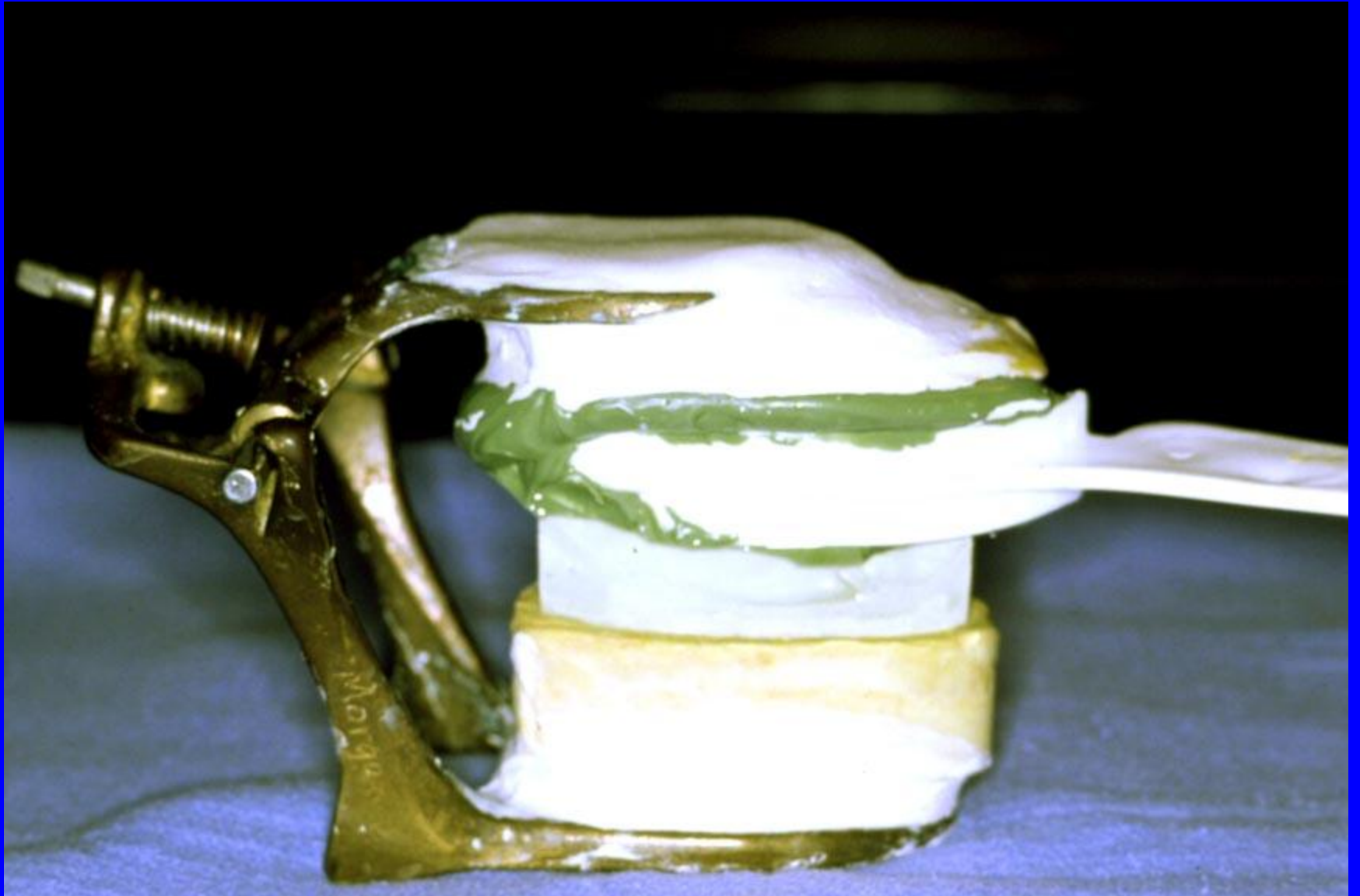
















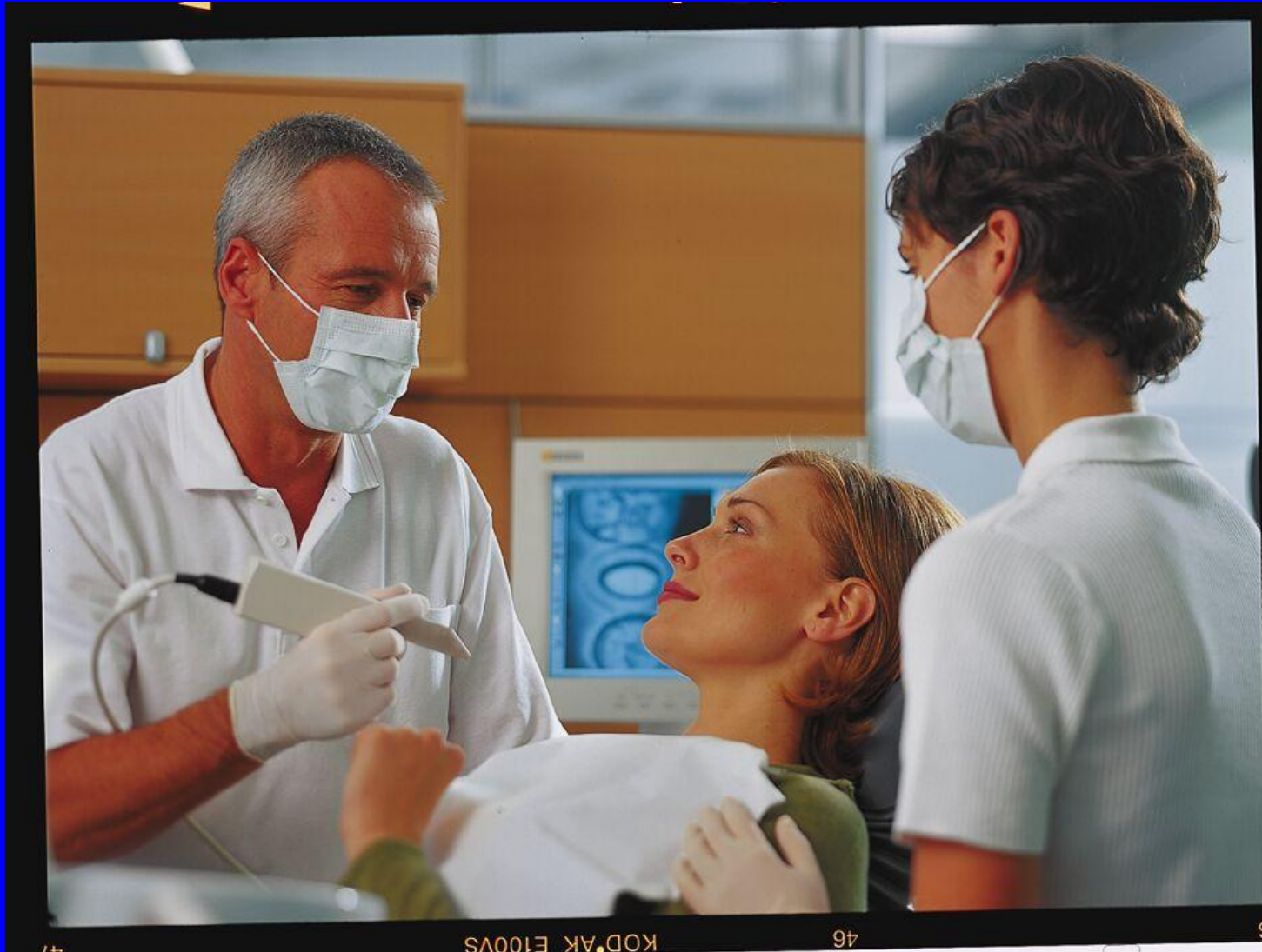
# Impression Evaluation

- 1- All prepared teeth walls and details of preparation
- 2- Record adgacent teeth .
- 3- Completed of finish line .
- 4- Completed cough beyonad Margin .
- 5- Any voids ----- remake .
- 6- Shiny suface in impression indicate Moisture contamination .

# Disinfection

- 2% Gatoraldehyde ( polysulfide , condensation and addition silicone)
- Iodophor spray for polyether

# Optical impression





• Cerec 2



• Cerec 3



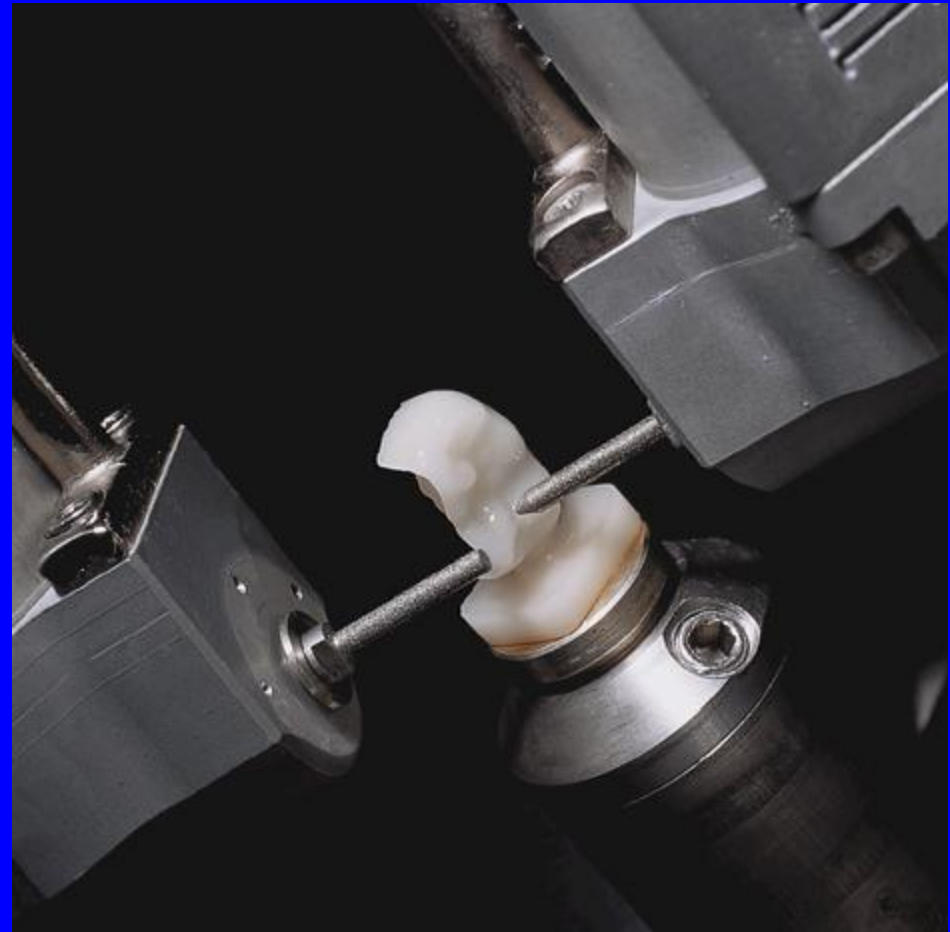
• Cerec inlab  
12.44

Dr. Tamer A. Hamza



- Designing the restoration using the Cerec 3D software

102



- Milling the restoration in the milling unit

12:44

Dr. Tamer A. Hamza

# iTero

- Cadent's iTero system, launched in 2007, and was designed purely as a digital impression taking system. The scan is sent to the iTero milling centre where a model is milled (the equivalent of a stone pour-up of a traditional impression) and sent to the laboratory of choice for fabrication of the restoration.







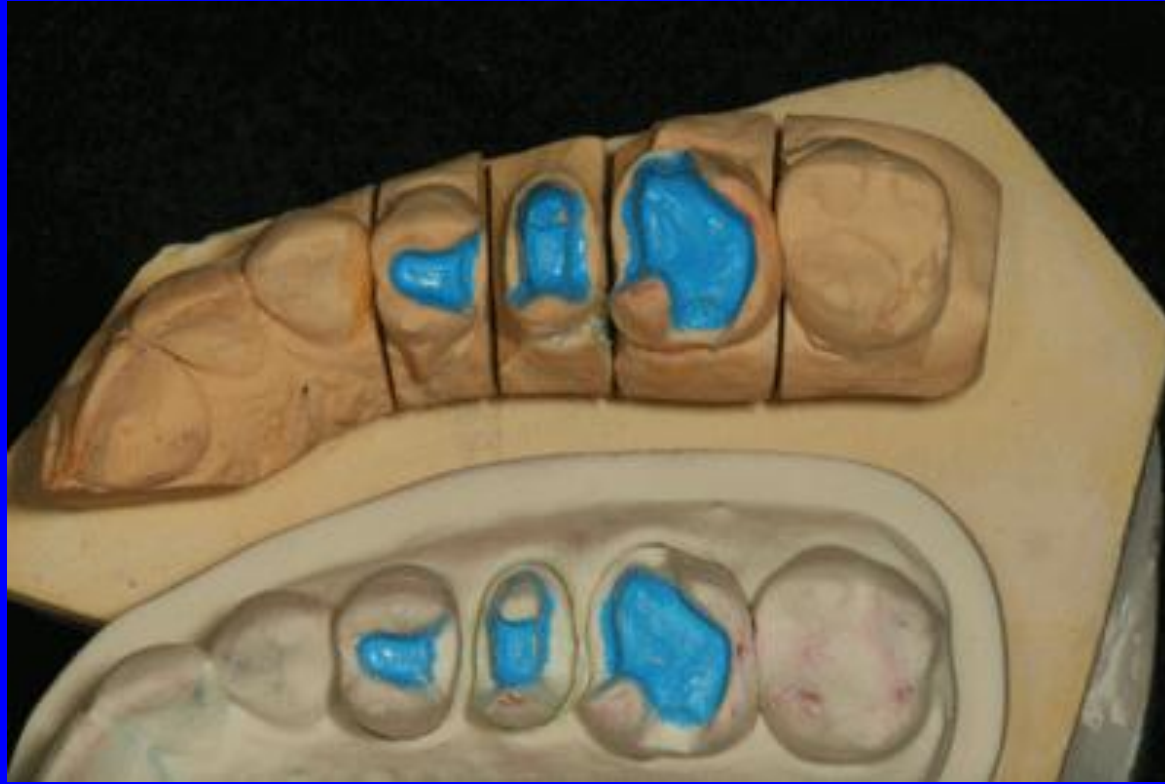


**A diode laser (EZLase: Biolase Technologies) is used to trough around the preparation in preparation for taking the optical mpression**



Retraction cord is "laid" into the trough created by the laser to deflect any tissue tags that may remain after the troughing procedure







# Lava chair-side Oral Scanner

- it was launched in 2008. Lava C.O.S. is used to scan the dentition chairside with the data from the scan used by the dental laboratory to design restorations including crowns, inlays, onlays and bridges.



# Treatment Planning



# Treatment planning

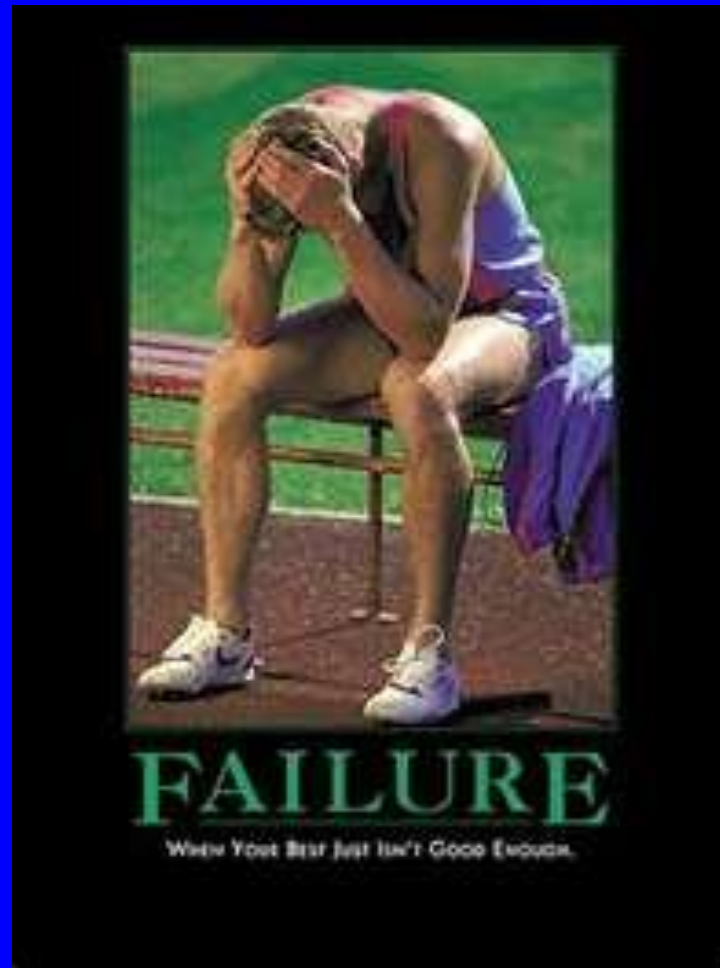
- Formulating a logical sequence of treatment designed to restore the patient's dentition to good health, with optimal function and appearance... Rosenstiel 2006

# What is an Ideal Treatment plan?

Treatment plan that achieves the best possible long-term outcomes for the patient, while addressing all patient concerns and active problems, **with the minimum necessary intervention**



- **90% percent of cases that fail, fail not during the restoration phase but in the treatment planning phase, failing to plan, is planning to fail**



Key for a good treatment plan

# Identification of patient need



- Guide your patient to the best treatment plan but never lead him



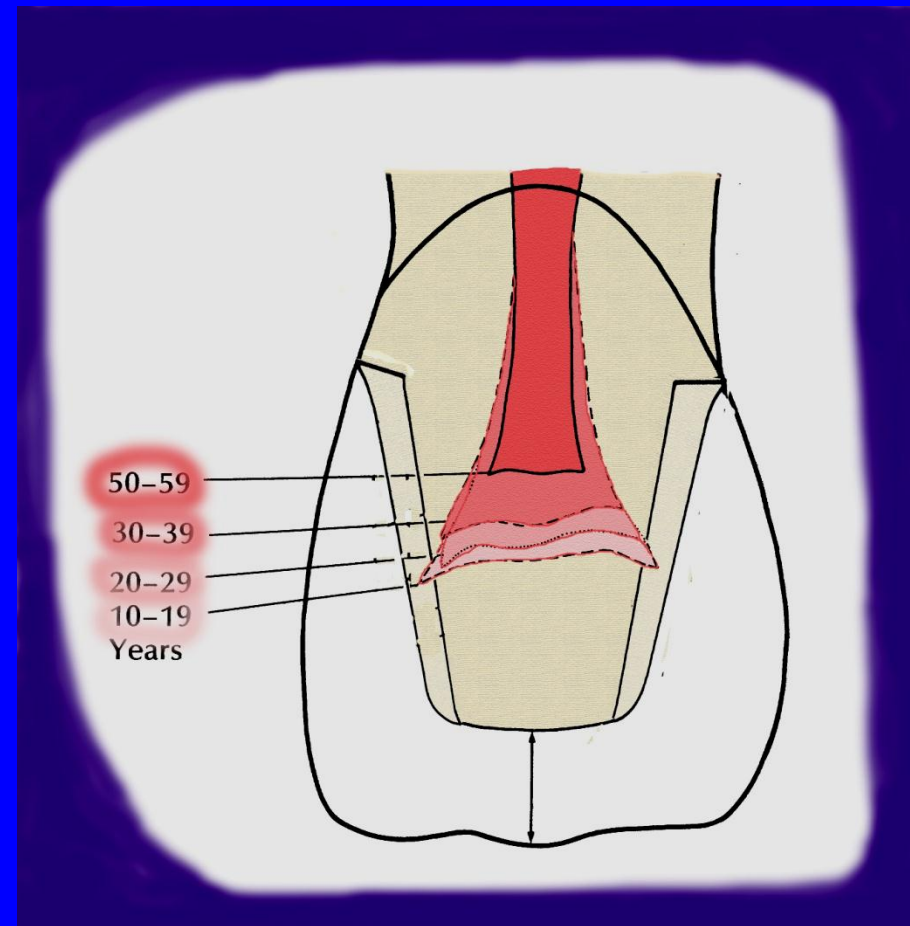
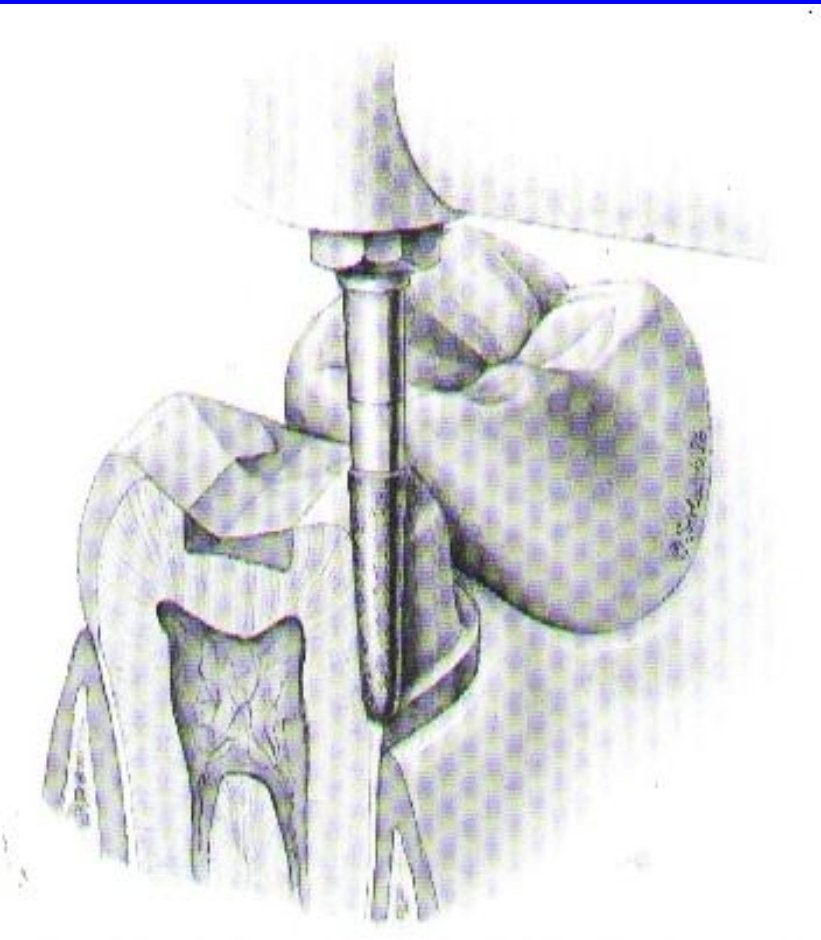
## *Use Simplified Prosthodontics*

**simple is  
beautiful.**



# Vital pulp therapy and fixed partial denture

# Tooth reduction



[Display Settings:](#) ☒ Abstract[Send to:](#) ☒[J Prosthet Dent.](#) 1992 Mar;67(3):323-5.

## Pulpal evaluation of teeth restored with fixed prostheses.

[Jackson CR](#), [Skidmore AE](#), [Rice RT](#).

Department of Endodontics, West Virginia University School of Dentistry, Morgantown.

### Abstract

The literature demonstrates that each of the elements of crown fabrication involves possible and probable insult to the pulpal tissues of the tooth. Preparation of the tooth can result in pulpal inflammation or even burn lesions. The impression technique can result in reduction of the odontoblastic layer caused by drying of the dentin. Temporary coverage of the preparation involves the use of self-curing resins and temporary cements, both of which can irritate the pulp. The final restoration is attached with cements that are often implicated in pulpal irritation. Dental caries and the procedures necessary to remove it and restore the tooth before preparation for a fixed prosthesis can injure the pulp. This study was done to evaluate the effects of complete coverage fixed prosthetic restorations on the dental pulp. A recall letter was mailed to 1221 patients who had received a fixed partial denture or single crown during the years 1984-1988. One hundred thirty patients were examined. Each tooth was evaluated for pulpal health, periodontal integrity, and clinical acceptability of the restoration. Of the 603 teeth examined, 166 had undergone root canal therapy before placement of the restoration, leaving 437 that were crowned while vital. Of these, 25 (5.7%) were in need of root canal therapy or had undergone root canal therapy after cementation of the fixed prosthesis.

PMID: 1507093 [PubMed - indexed for MEDLINE]

[MeSH Terms](#)[LinkOut - more resources](#)

### Related citations

[A retrospective study of pulpal response in vital adult teeth prepared for crown preparation.](#) [J Prosthet Dent. 2002][Assessment of the periapical and clinical status of crowned teeth over 25 years.](#) [J Dent. 1997][Fate of vital pulps beneath a metal-ceramic crown or a bridge retainer.](#) [Int Endod J. 2005][Review Outcomes of root canal treatment and restoration, implant-suppl.](#) [J Prosthet Dent. 2007][Review For teeth requiring endodontic treatment, what are the \[Int J Oral Maxillofac Implants. 2007\]](#)[See reviews...](#)[See all...](#)

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# So what

Don't think so much of a vital part  
therapy with Fpd



# Implant versus endodontic



Endodontics or implants? A review of decisive cr... [Int Endod J. 2009] - PubMed - NCBI - Windows Internet Explorer

http://www.ncbi.nlm.nih.gov/pubmed/19548936

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Int Endod J. 2009 Sep;42(9):757-74. Epub 2009 Jun 22.

**Endodontics or implants? A review of decisive criteria and guidelines for single tooth restorations and full arch reconstructions.**

Zitzmann NU, Krastl G, Hecker H, Walter C, Weiger R.

Clinic for Periodontology, Endodontology and Cariology, University of Basel, Basel, Switzerland. n.zitzmann@unibas.ch

**Abstract**

This review describes practical criteria and a systematic process to aid the treatment planning decision of whether to preserve teeth by root canal treatment (RCT) or extract and provide an implant. Recommendations presented are based on best available evidence from the literature and the expert views of specialists in endodontics and restorative dentistry, including dental implantology. A MEDLINE search was conducted using the terms 'root canal therapy', 'dental implants', 'decision making', 'treatment planning', 'outcome' and 'human', and supplemented by hand-searching. When evaluating the outcome of root canal treatment, an observation period of 4-5 years is required for complete healing of periapical lesions. Dental implants, however, present a de novo situation and a functional period of at least 5 years is often required before peri-implant diseases are established and detected. Good long-term success rates and greater flexibility in clinical management indicate that RCT or retreatment should be performed first in most instances unless the tooth is judged to be unrestorable. When deciding if a compromised tooth of questionable prognosis should be maintained or replaced by an implant, both local, site-specific and more general patient-related factors should be considered. Following systematic evaluation and consideration of the best treatment option in a particular case, a treatment recommendation may then be given in favour or against tooth retention. Whilst single risks are possibly accepted for single tooth restorations, teeth with questionable prognosis and multiple pre-treatment requirements are better not included as abutments in fixed dental prostheses to reduce the risk to survival of the entire restoration.

PMID: 19548936 [PubMed - indexed for MEDLINE]

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J Endod. 2011 Jul;37(7):903-9. Epub 2011 May 17.

### Quality of life of endodontically treated versus implant treated patients: a University-based qualitative research study.

Gatten DL, Riedv CA, Hong SK, Johnson JD, Cohenca N.  
Department of Endodontics, University of Washington School of Dentistry, Seattle, WA 98195-7448, USA.

**Abstract**

**INTRODUCTION:** Up-to-date studies comparing endodontic treatment versus implant-supported prosthesis have shown similar clinical outcome and survival rates. However, no data are available comparing both treatment modalities based on the patient's perception of quality of life. This study was designed to qualitatively describe and compare the quality of life of patients with restored, single endodontically treated teeth versus patients with single implant-supported fixed prostheses.

**METHODS:** Forty-eight patients agreed to participate in the study (n = 24 from each treatment modality). Of those, 37 actually participated in the study: 17 were endodontically treated and 20 had an implant-supported prosthesis. Patients in each of the two groups were randomly selected from the Graduate Endodontics and Graduate Periodontics Departments, respectively. Six focus group discussions (n = 3 per treatment group) were held and audio-recorded for subsequent thematic analysis. Data were analyzed to identify common themes within each category and compared to assess any differences in quality of life between the two treatments. Additionally, a quality of life survey, the shortened version of the Oral Health Impact Profile (OHIP-14), was given before the discussion group and the responses analyzed.

**RESULTS:** The results obtained from this study show similar overall OHIP scores and show a high rate of satisfaction with both treatment modalities. Content analysis of the discussion groups revealed several themes and subthemes. The major themes were importance of overall health, financial implications of the treatments, perception of the treatments and its outcomes, time since treatment, and follow-up dental visits.

**CONCLUSIONS:** The results help identify patients' perception and concerns with each treatment modality and assist the clinician and patient in the selection of an optimal treatment for their given situation. In addition to the prognosis and outcomes, clinicians should consider patients' perceptions and preferences as well as the influence each therapy may have on their quality of life, both short- and long-term. Overall, all the participants in this study were pleased with the treatment received and expressed a clear message to save their natural dentition whenever possible.

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PMID: 21689542 [PubMed - indexed for MEDLINE]

+ Publication Types, MeSH Terms  
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**Review** For teeth requiring endodontic treatment, what are the [Int J Oral Maxillofac Implants. 2007]  
Patient satisfaction and oral health-related quality of life [Int J Oral Maxillofac Implants. 2010]  
Treatment outcomes of fixed or removable implant-supported prosthesis [J Prosthet Dent. 2000]  
Comparison of three-implant-supported fixed dentures and [Int J Oral Maxillofac Implants. 2011]  
**Review** Dental dilemmas: Endodontics or dental implants? [Dent Update. 2010]  
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Think conservative



# Inlay fixed bridge

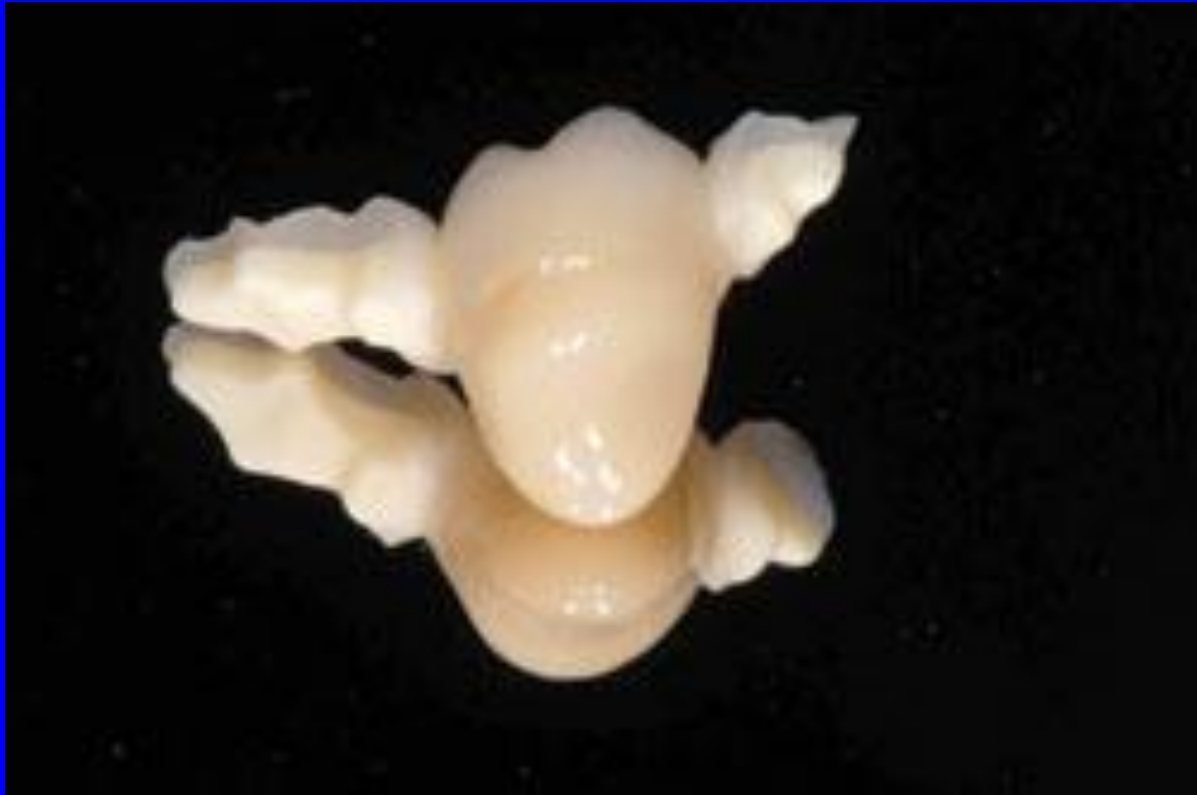
















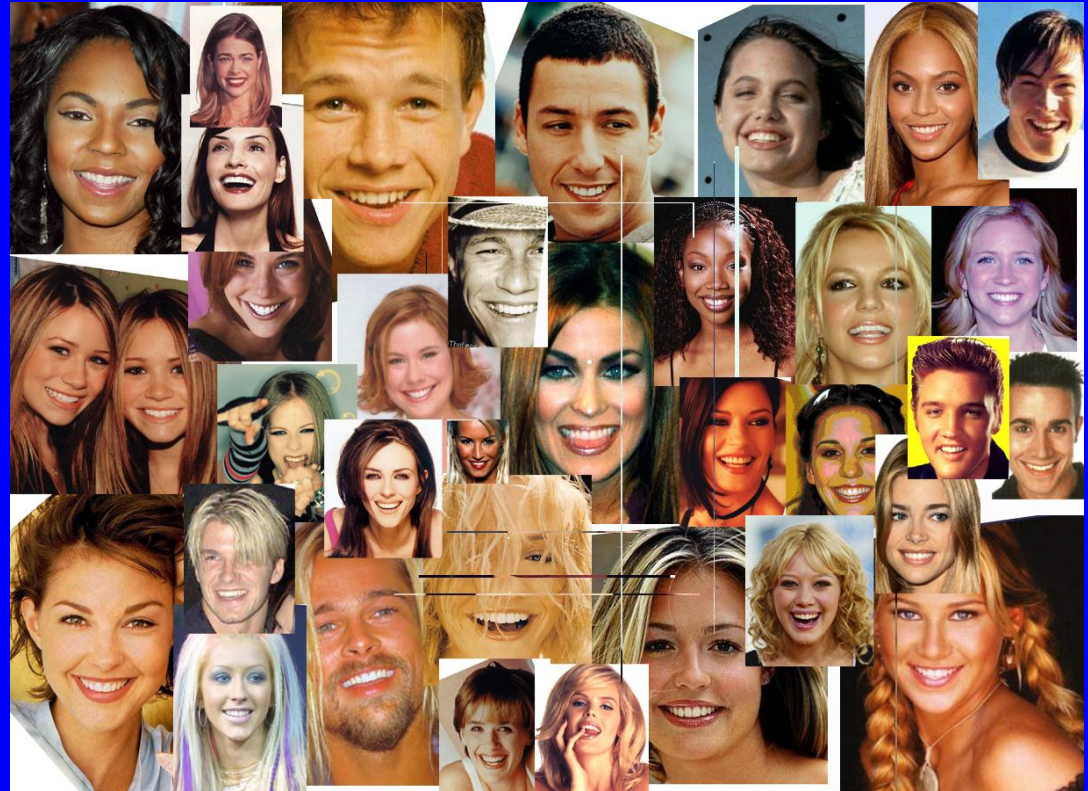
- Knowledge of different material and technique and advantages of each of them



## Mini-esthetics:

The smile framework  
bordered by the lips on  
smile animation

- Excessive or inadequate gingival display
- Excessive buccal corridors

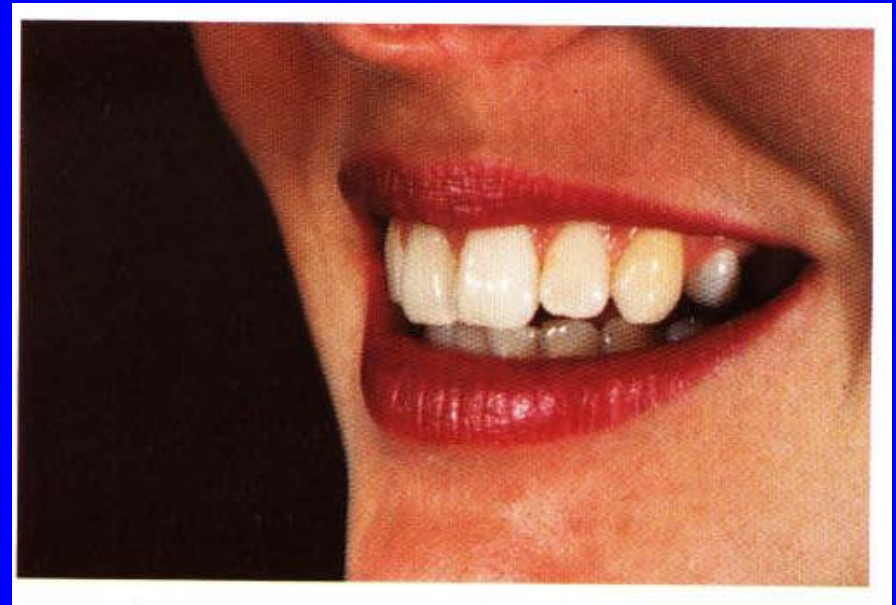


# Ideal smile

- Most people will judge a smile by teeth alone, but there is a great deal more to the ideal smile. Teeth, lips, and the soft tissue (gums) surrounding the teeth together make up a smile. If any of these three components deviate from the accepted normal, the smile may appear to be unsightly, even if the teeth are straight and white.



- Most attractive smiles is that in which the incisal edges of maxillary teeth were parallel to the lower lip a factor which should be considered when shaping the restorations









# Smile Arc

the curvature of the maxillary teeth in relation to the curvature of the lower lips or tooth/lip arc difference.



- What is LARS



# Lip length

Table 1 Maxillary lip length in relation to anterior tooth exposure

Maxillary lip classification	Maxillary lip length (mm)	Exposure of upper central incisor (mm)	Exposure of lower central incisor (mm)
Short	10-15	3.92	0.64
Medium	16-20	3.44	0.77
Medium	21-25	2.18	0.98
Long	26-30	0.93	1.95
Long	31-36	0.25	2.25

# AGE

- Youthful smile more maxillary teeth
- Old age smile more lower teeth appear









# Race

Race



# Gender

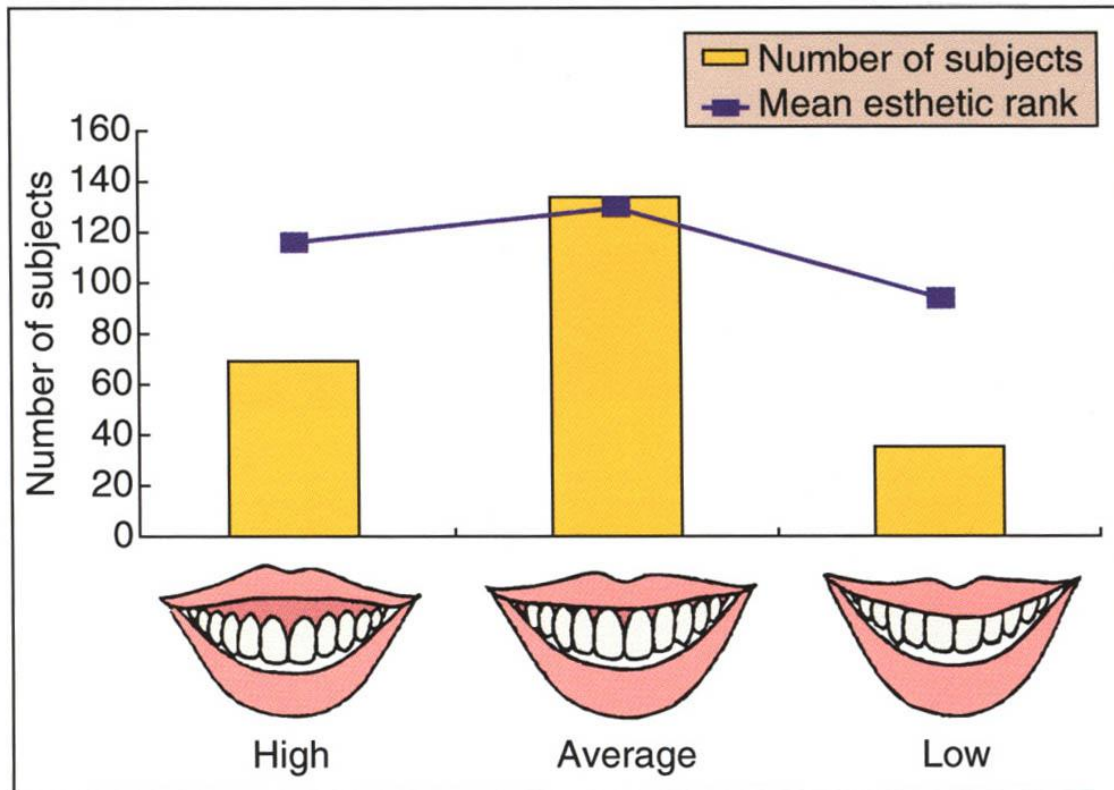
- Female twice than male



before the amount of tooth exposure at rest is prescribed for the proposed prostheses, each patient should be assessed according to the LARS factor



# Gingival display







# Buccal Corridor Width



# Micro-esthetics

- Tooth proportions in height and width
- Gingival shape and contour, black triangles
- Tooth shade.

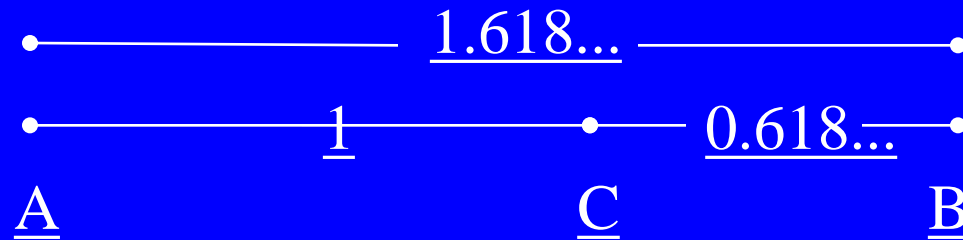


# WHAT IS THE GOLDEN PROPORTION?

- Golden Proportion exists between a small and a large segment: The proportion of the small segment to the large is the same as the proportion of the large segment to the sum of both.  $\varphi = \frac{1 + \sqrt{5}}{2} = 1.6180339887\dots$

# Golden Proportion ( $\phi$ )

A line (AB) is divided with a point (C) such that the ratio of the large part (AC) to the small part (CB) is the same as the ratio of the whole (AB) to the large part (AC)



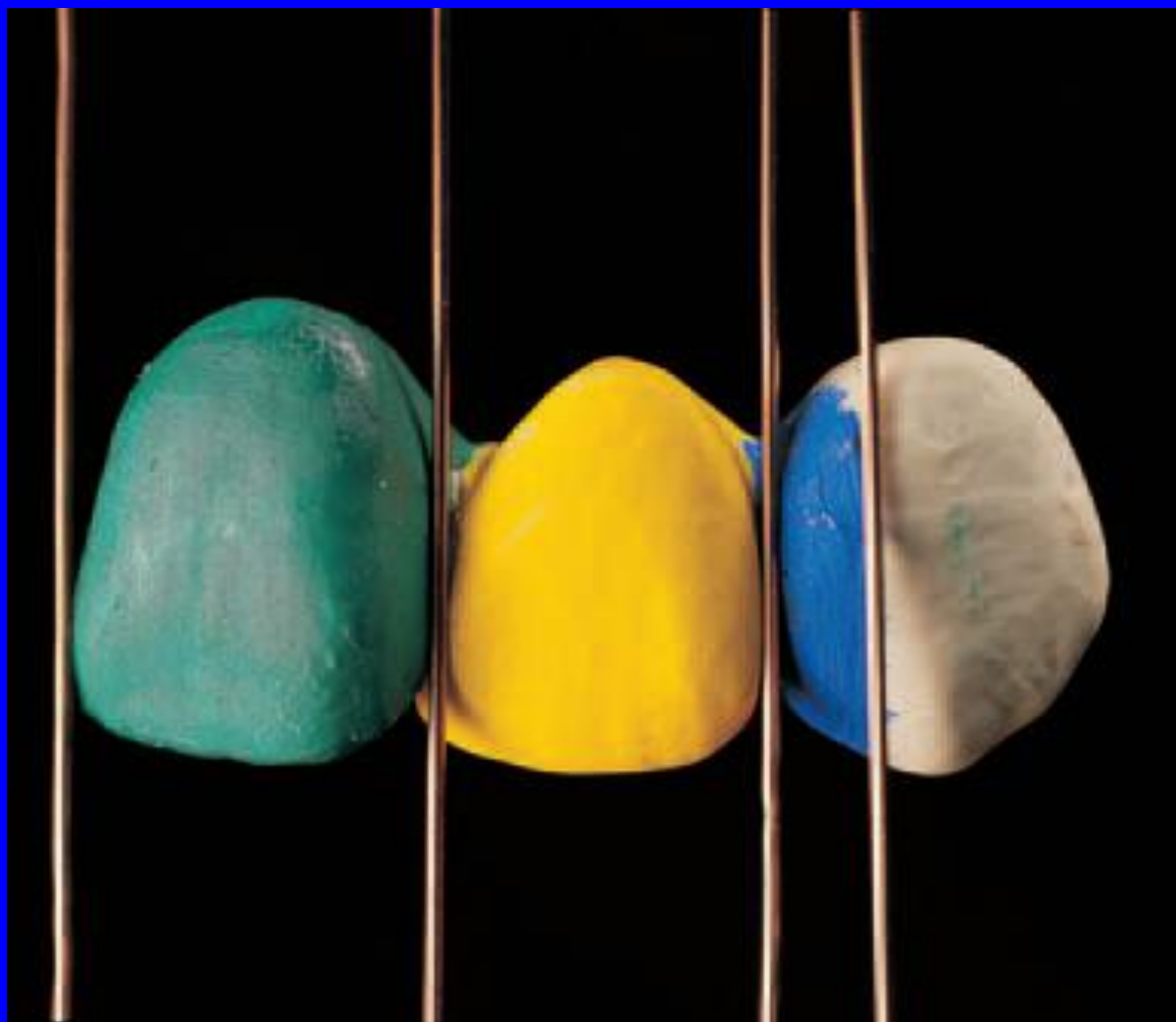
$$\frac{\underline{\underline{CB}}}{\underline{\underline{AC}}} = \frac{\underline{\underline{AC}}}{\underline{\underline{AB}}}$$







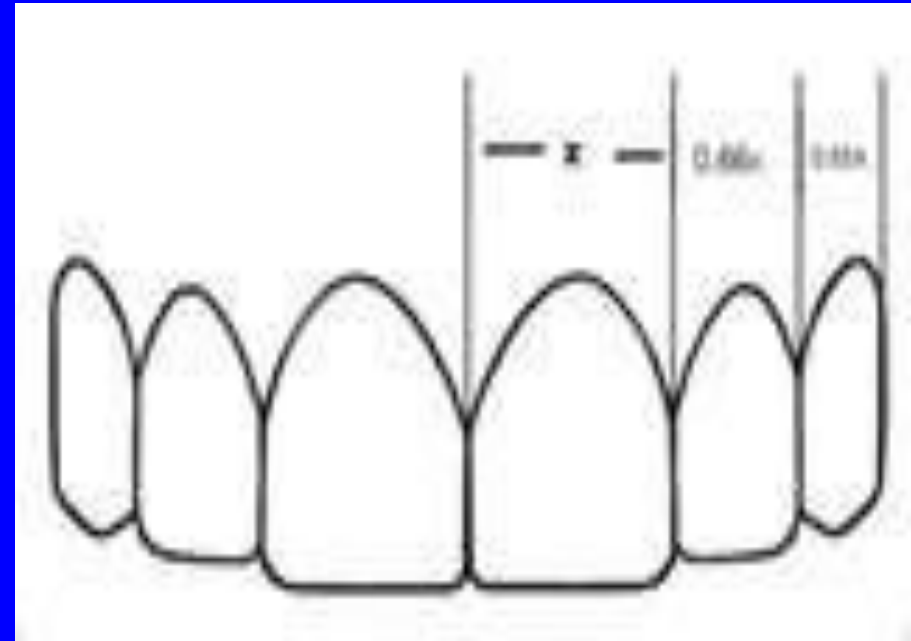




# Recurring esthetic dental proportion concept

Recently was introduced it state that :

The proportion of the successive width of the teeth viewed from the frontal aspect should remain constant as one move distally





**tooth shape can be affected by:**  
**Age**



## Gender



Feminine  
teeth:



Masculine  
teeth

## Width-to-height ratio of the maxillary teeth

- Tooth size is determined by mesio-distal width
- divided by the inciso-gingival length, which
- yields the width/length (w/l) ratio



- Width/length ratio (w/l): the blue tooth has a w/l ratio of 0.8, the red ('ideal') 0.75, and the green 0.6 value less than 0.6 creates a long narrow tooth, and beyond this number results in a short wide tooth





# Central Incisor Width-to-Height Ratio



Group



# Central Incisor Angulation



Group

# Lateral Incisor Angulation



Group



# Lateral Incisor Length



Group

# Embrasures



Group

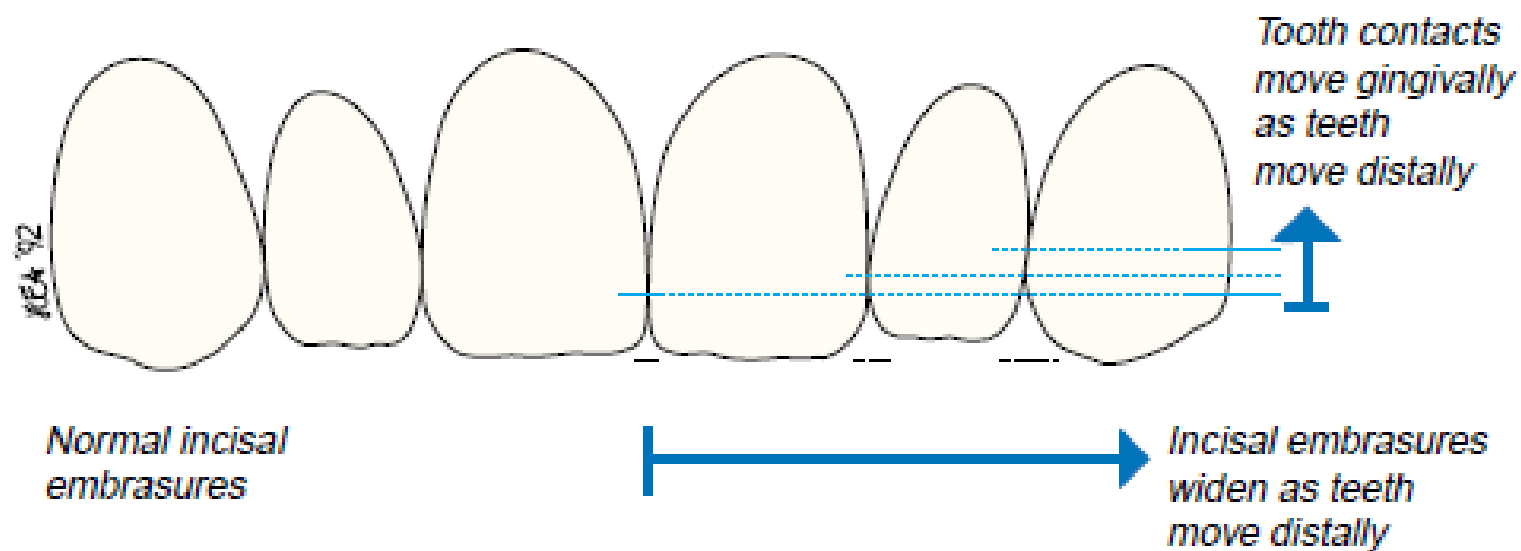
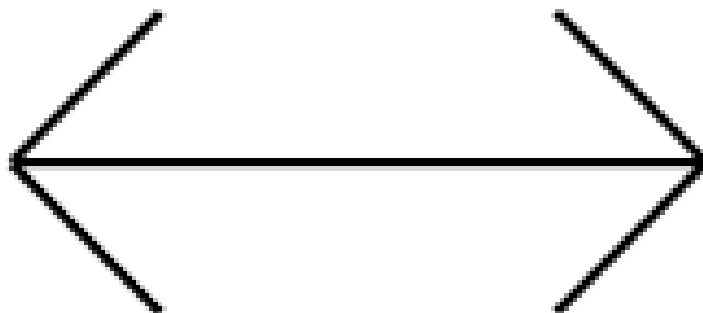


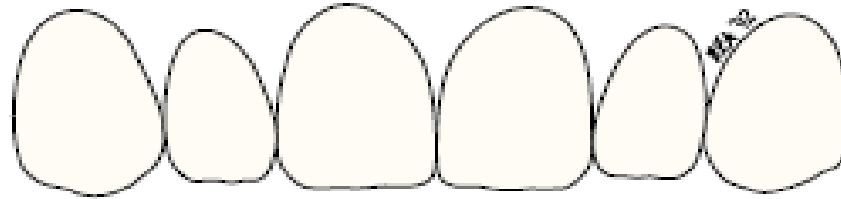
Figure 12-3. Schematic of embrasure form and contacts in normal teeth.





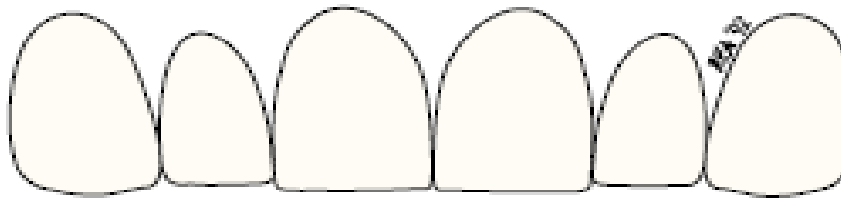
Normal appearing tooth width

Normal incisal embrasures



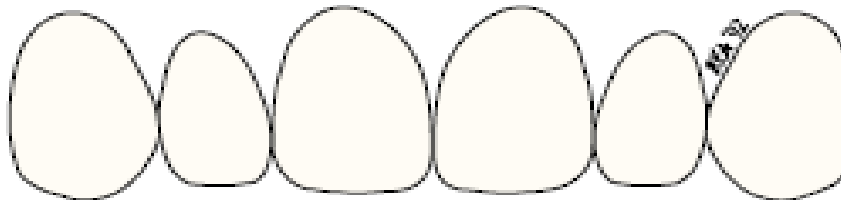
Wider appearing tooth width

Smaller than normal incisal embrasures



Narrower appearing tooth width

Wider than normal incisal embrasures



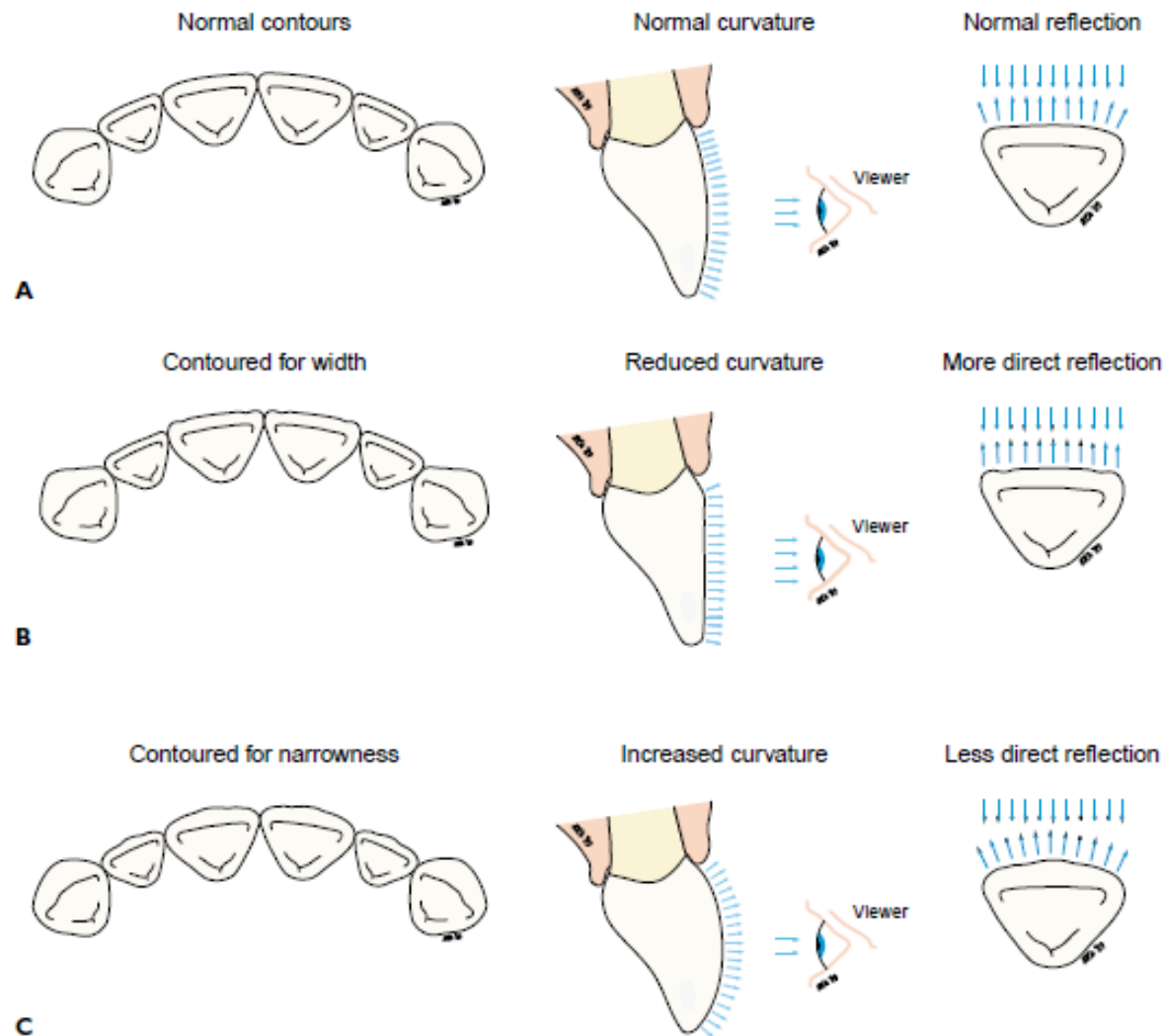
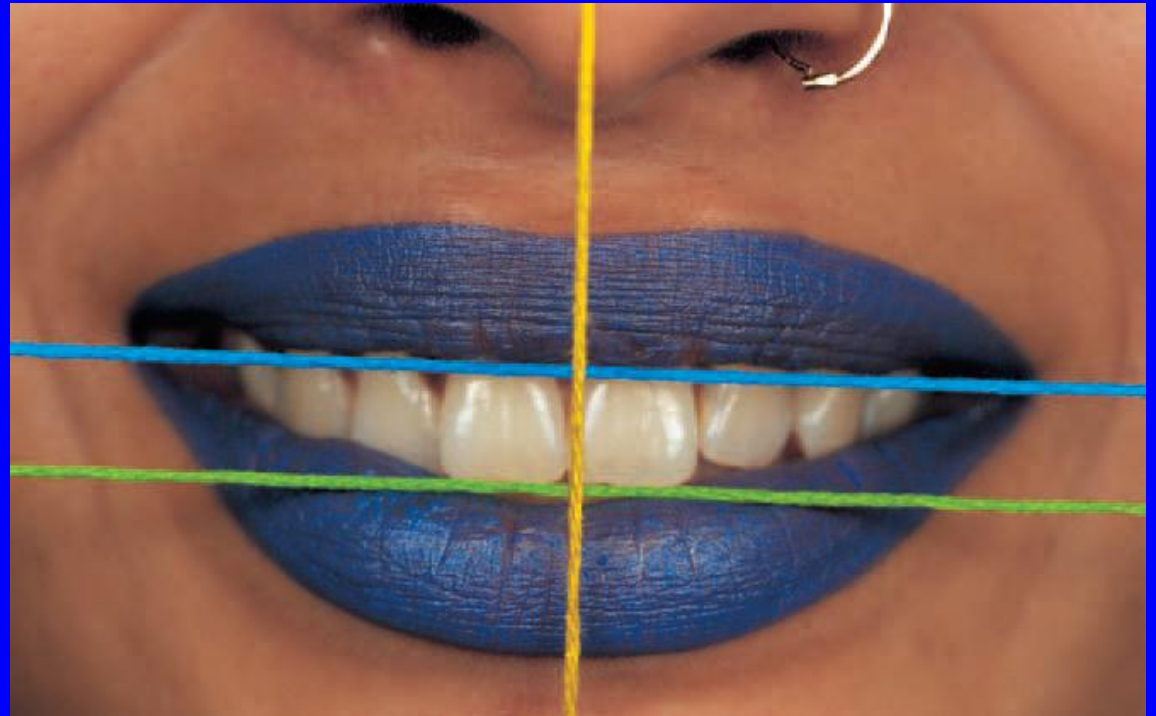


Figure 12-5. Schematic of the impact of altering contours to affect the perception of tooth length and width: *A*, normal contours; *B*, teeth contoured to reduce curvature and light reflection and create the appearance of greater width; and *C*, teeth contoured to enhance curvature and light reflection and create the appearance of less width.

- Midline



# Balance





# Diagnostic wax-up

- It is defined by the glossary of prosthodontic terms as a dental diagnostic procedure in which planned restorations are developed in wax on a diagnostic cast to determine optimal clinical and laboratory procedures necessary to achieve the desired esthetics and function



## Cosmetic Mockups









Cosmetic  
Mockups







# Types of diagnostic mock ups

## 1-Priminary diagnostic mock up

used free hand intraoral  
composite can be done on  
incisal and gingival to  
stimulate crown  
lengthening no prep no  
etch no bond

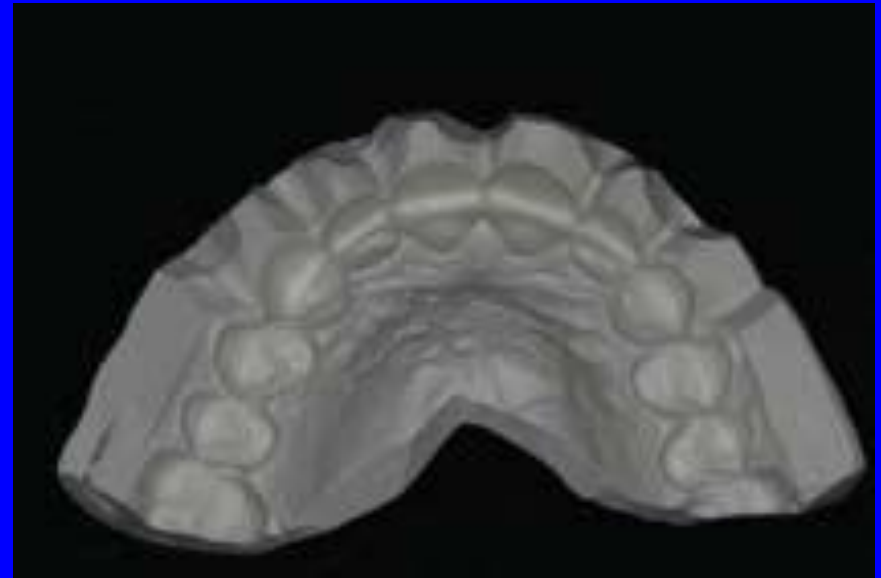
Completely reversible

If there is composite filling  
we should lubricate it to  
prevent bonding



## 2-secondary diagnostic mock-up

- is done after the diagnostic wax-up has been made. It is formed using a silicone matrix made
- from the diagnostic wax-up). The matrix is filled with autopolymerizing resin (figure placed over the unaltered natural teeth and removed upon final polymerization.



















- Case done in the Ohio state university by resident in the restorative department 2003









# Diagnostic Wax-up





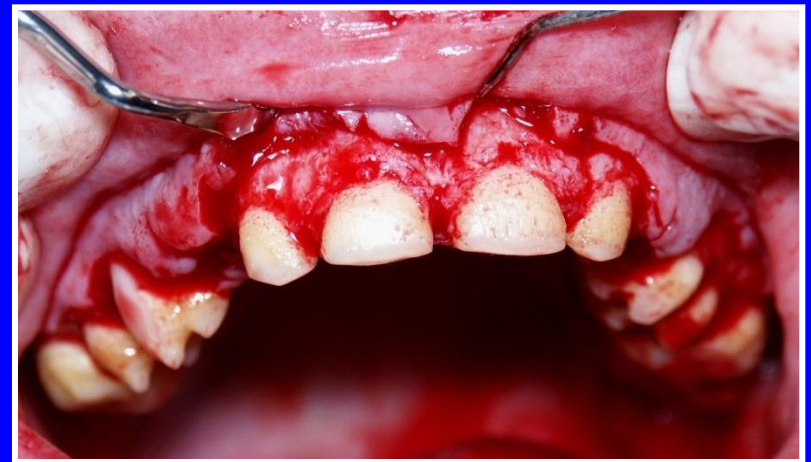
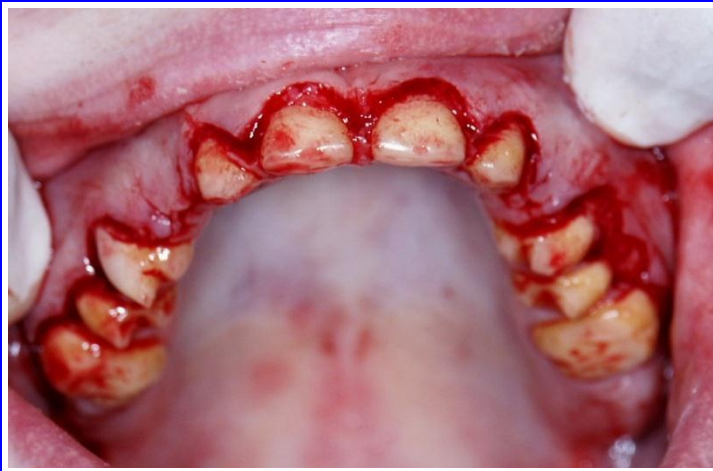
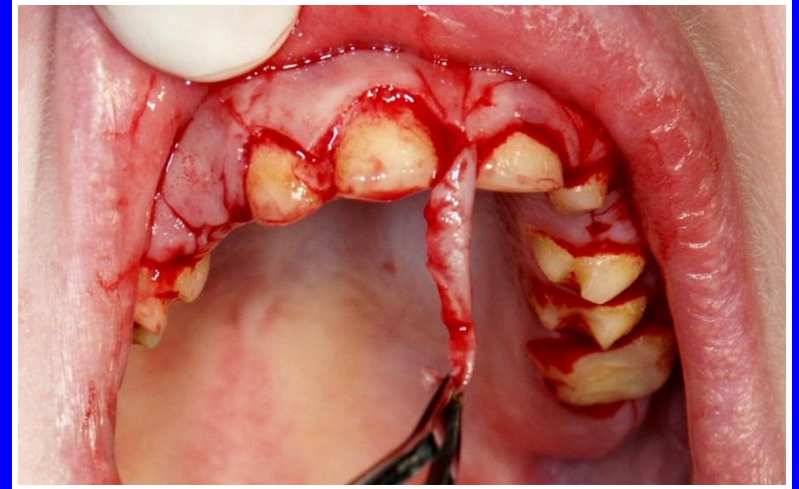


# Diagnostic Wax-up





# Crown Lengthening











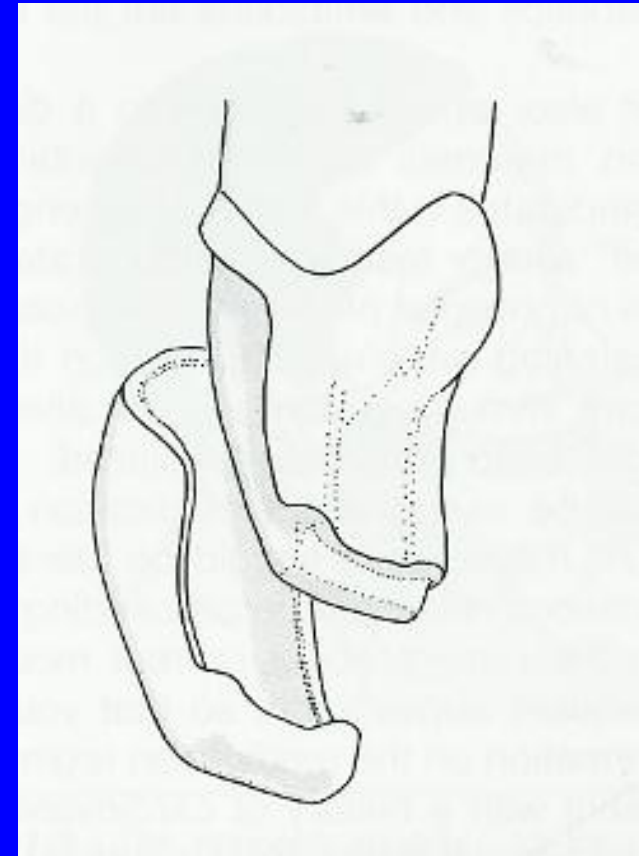


# Laminate veneers

Dr .Tamer A.Hamza

# Laminate veneers

- Laminate veneer: thin layer of cast ceramic bonded to the facial surface of tooth with resin
- Veneers are utilized in different thickness and dimensions depending on requirements of the given clinical situation
  - In some cases they are thin coverings luted to the minimally prepared enamel.
  - In other cases they are fairly thick, covering not only enamel but exposed portions of dentine



# *Indications*



To modify tooth color and shade ,





To modify tooth shape, shape, length, alignment



# Enamel dysplasia



Restore a fracture cracks,



# Close a space



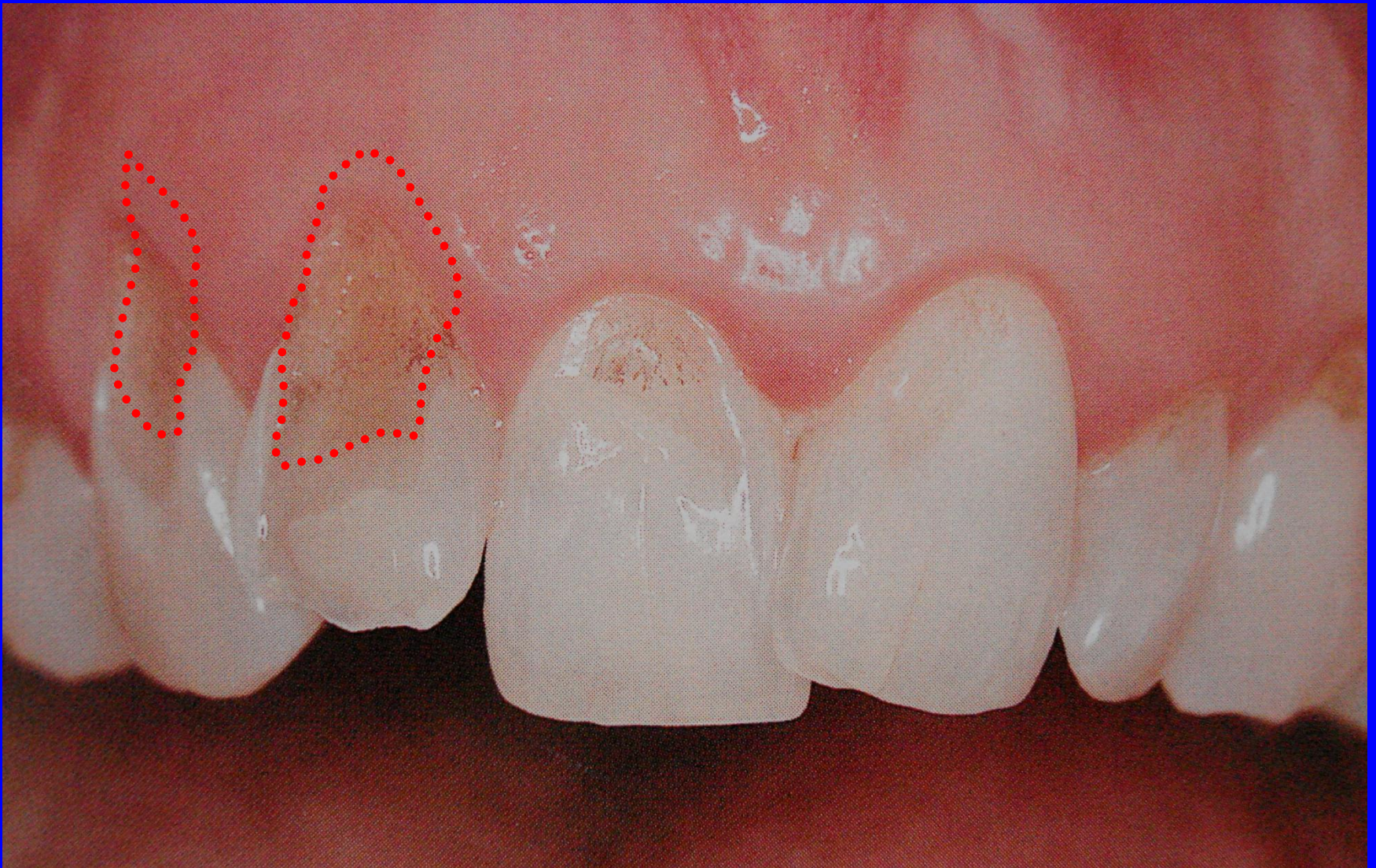






# Contraindications

# 1-Extensive loss of supporting enamel







Missing large portion  
due to fracture



Full coverage crowns

## 2. Unsuitable anatomic presentation ( Short or triangular teeth)







Peg-Shaped lateral incisors

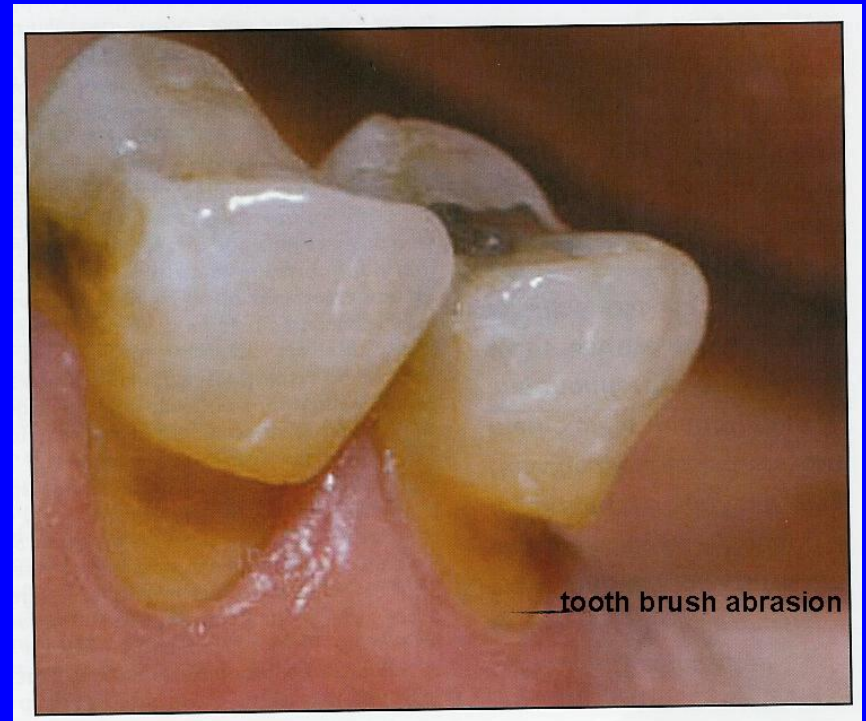


Full coverage crowns



# Severe abrasion

- Loss of tooth material that is not because of the physiology of mastication is called abrasion
- such as foods that contain abrasive materials (tobacco), Habits of biting pipe or other object, or use a hard brush



# Abfraction

- **Theory of Abfraction** is a theory explaining the non-carious cervical lesions (NCCL). It suggests that they are caused by flexural forces;



# Severe attrition



Fig. 1: Attrition



Crowded and discolored teeth

**Moderate**  
**malposition**



Full coverage crowns





Extreme lower crowding



Orthodontic treatment



**Severe**  
**malposition**



## 7-Oral habits nail biting



**pencil biting**



# Root canal treated tooth





**Poor dental care**  
**and hygiene**



Any bonded prosthesis  
should be avoided

# Types of laminate

## 1-Direct veneer

using composite this  
is don't inside the  
patient mouth



## 2-Indirect veneer

composite or ceramic  
Done in the lab





Direct laminate veneers

Light-cured composite resin build up to the entire visible etched enamel surface.

When adding Composite resin for a direct veneer we may:

- 1) Use a labial **crown form**.
- 2) Add composite resin . **free-hand**.

1) Use a labial crown form.



2) Add free hand.



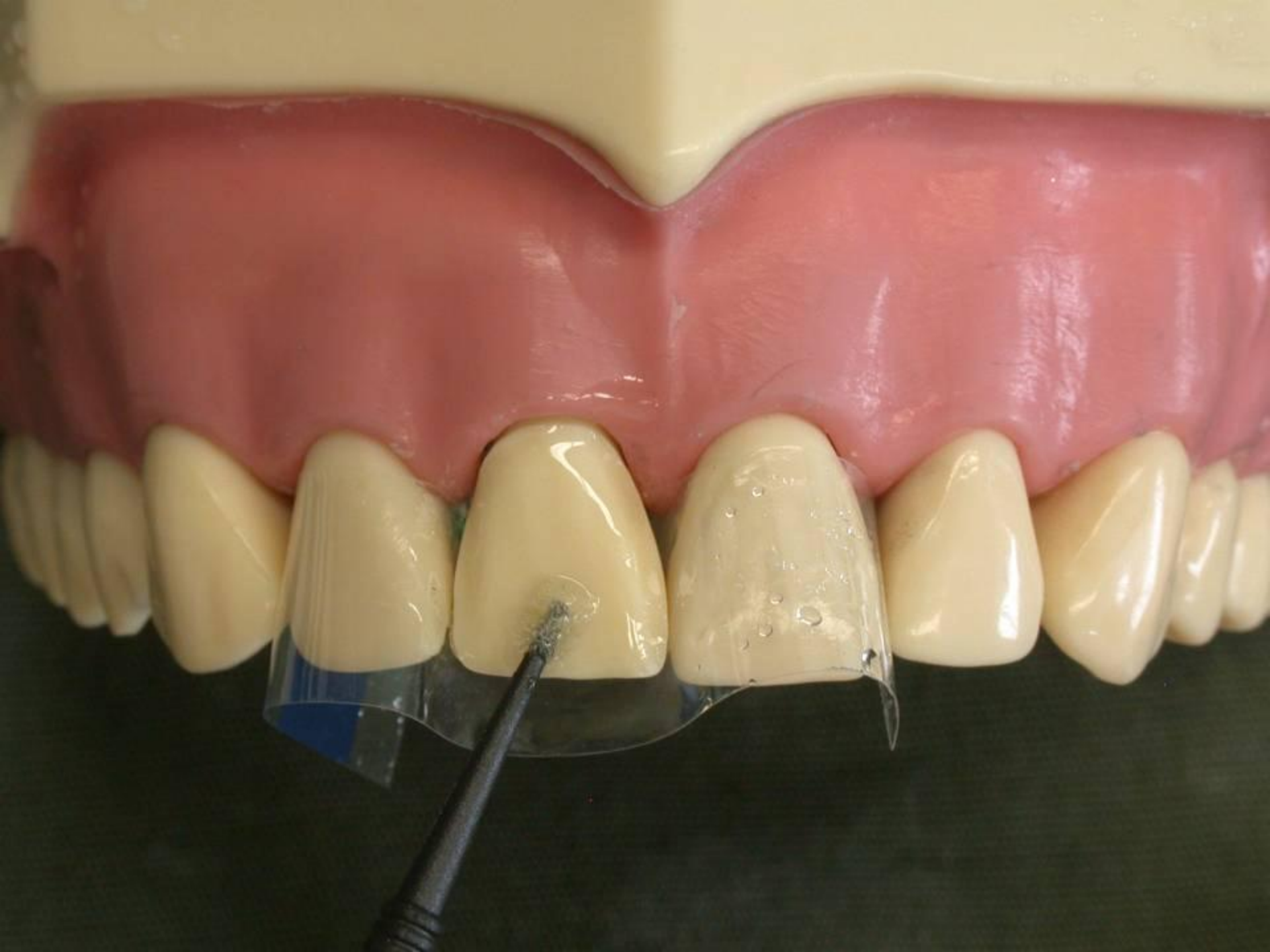


**Tooth prepared**









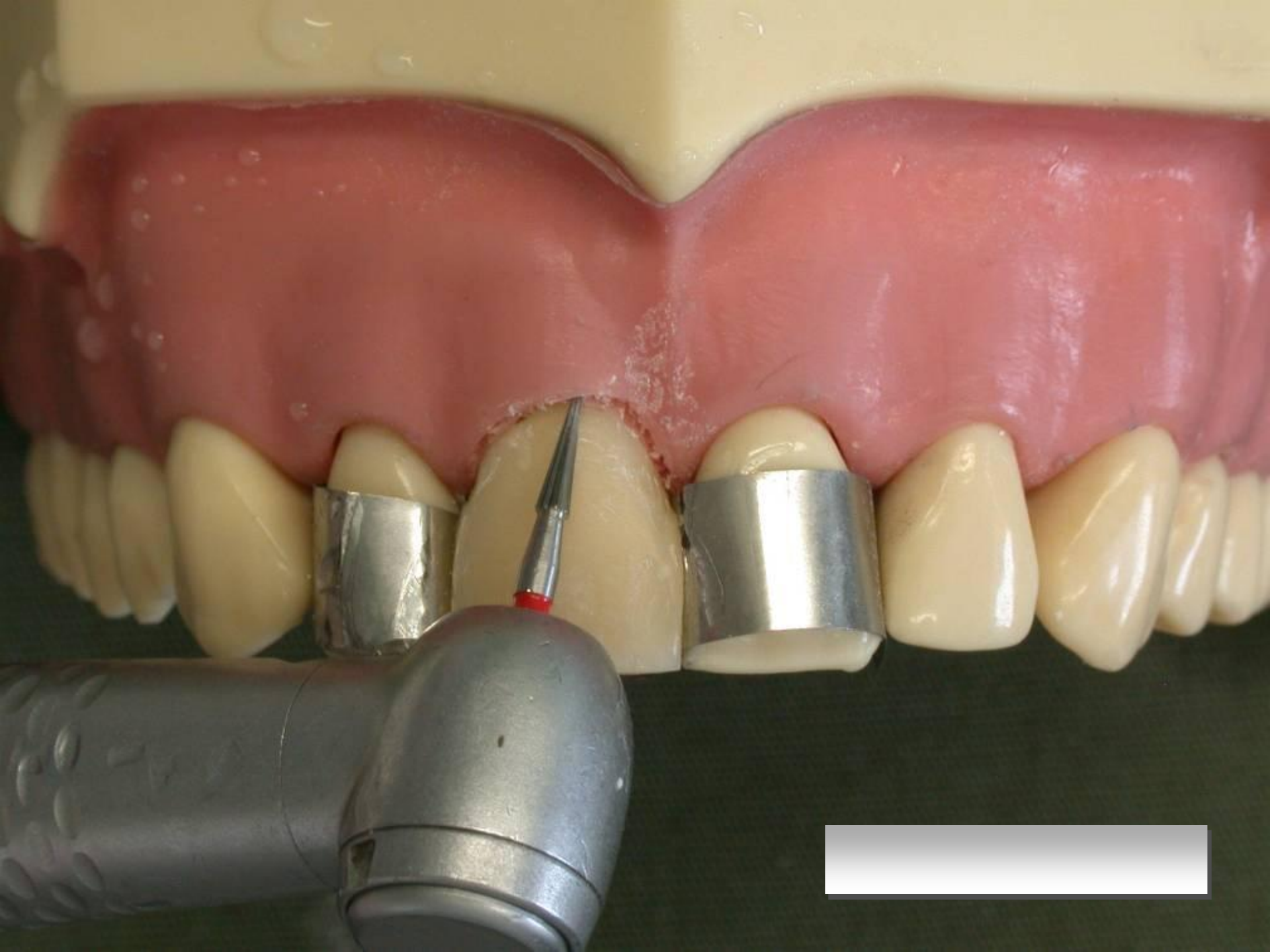


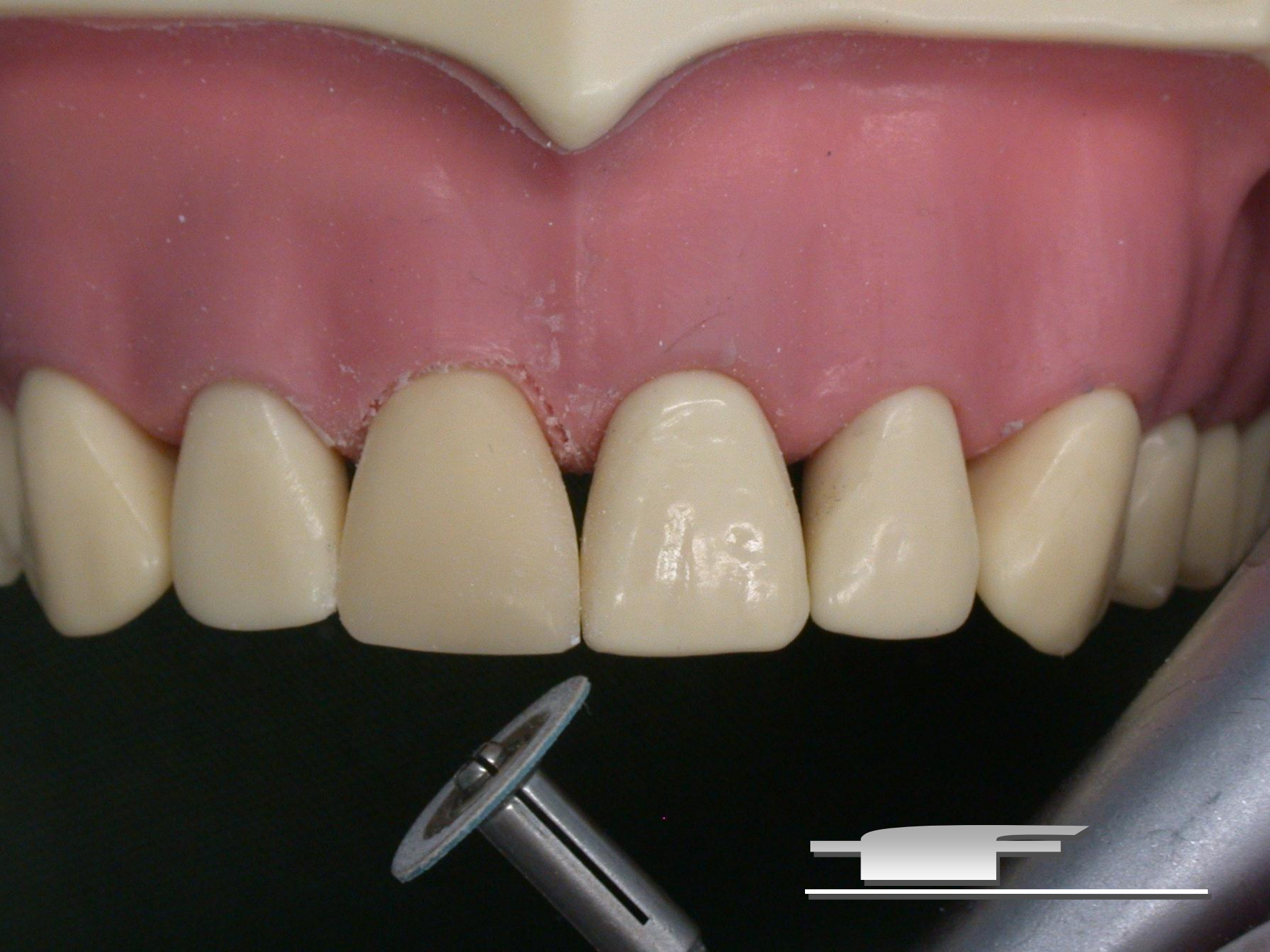




















# Advantages

- One appointment only



- Low cost



- Repair



# Disadvantages

- **Time** consuming.





- Requires artistic skills.



Exhibit poor color stability and wear resistance.



## Single veneer

- Single veneer on a central is the most challenging task – difficult, if not impossible to match the natural teeth perfectly
- Shade can be modified some by use of different colored resin cements

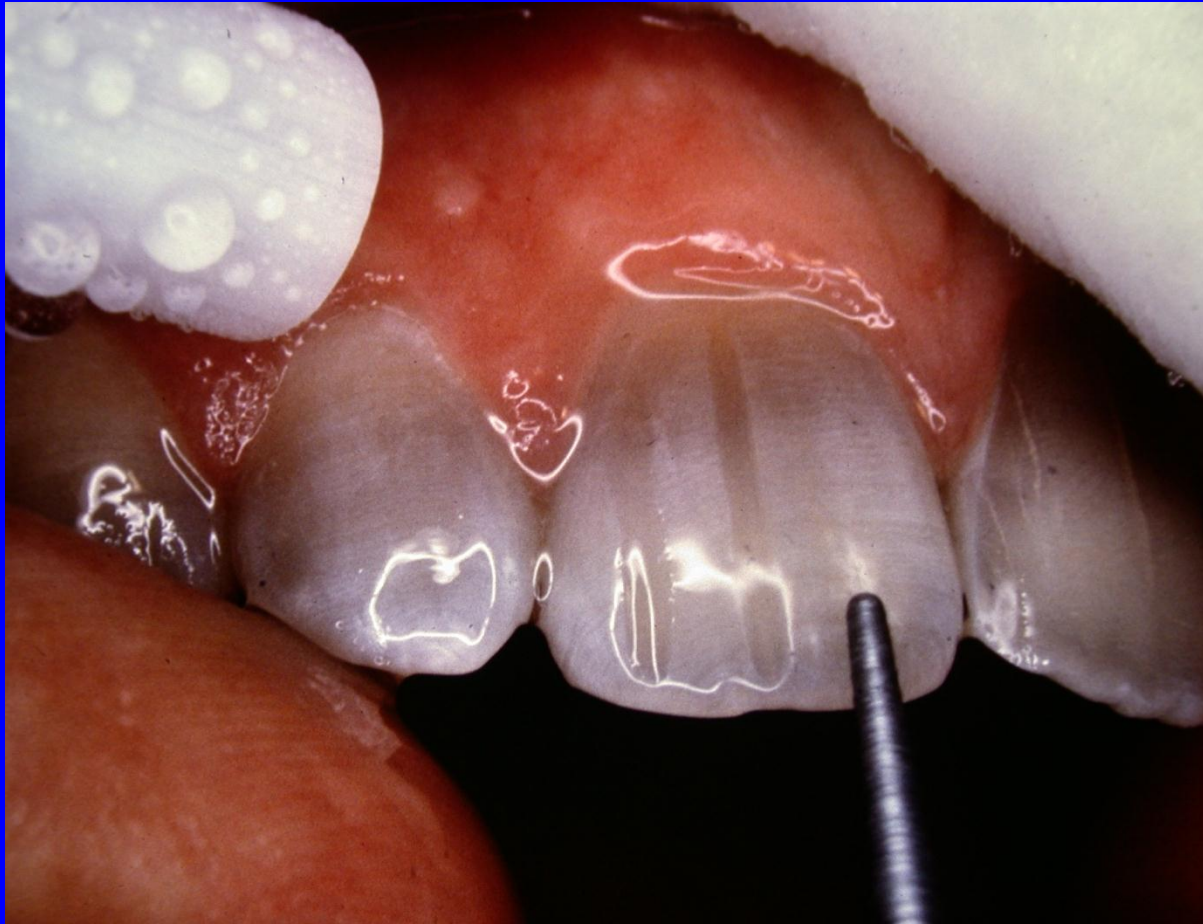
## Multiple veneer

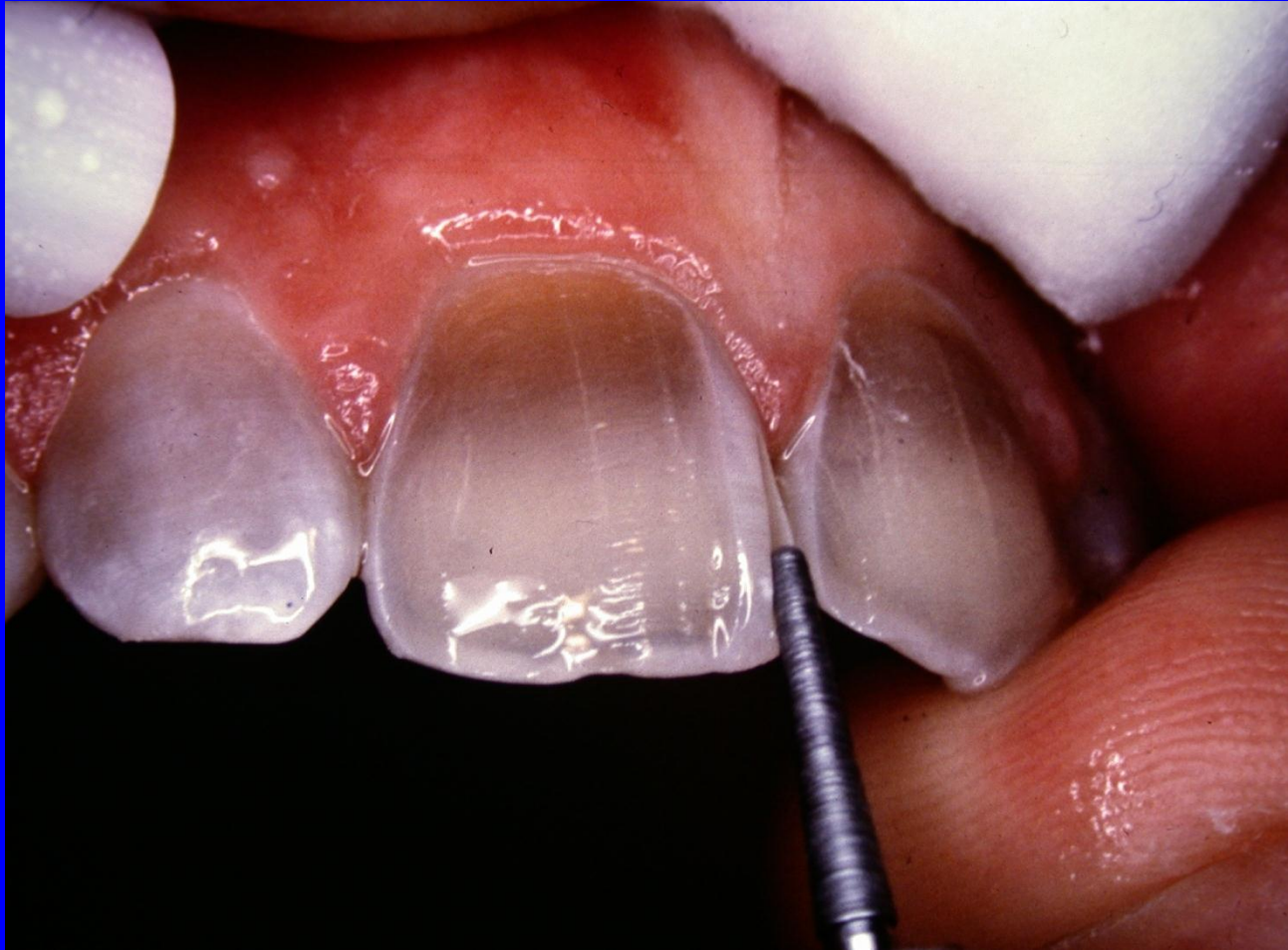
- Easy shade
- Placing even numbers (2,4,6,8) of veneers is easier because a balanced look may be obtained
- Better not to do cuspids (if possible) as the contrast between anterior and posterior is accentuated

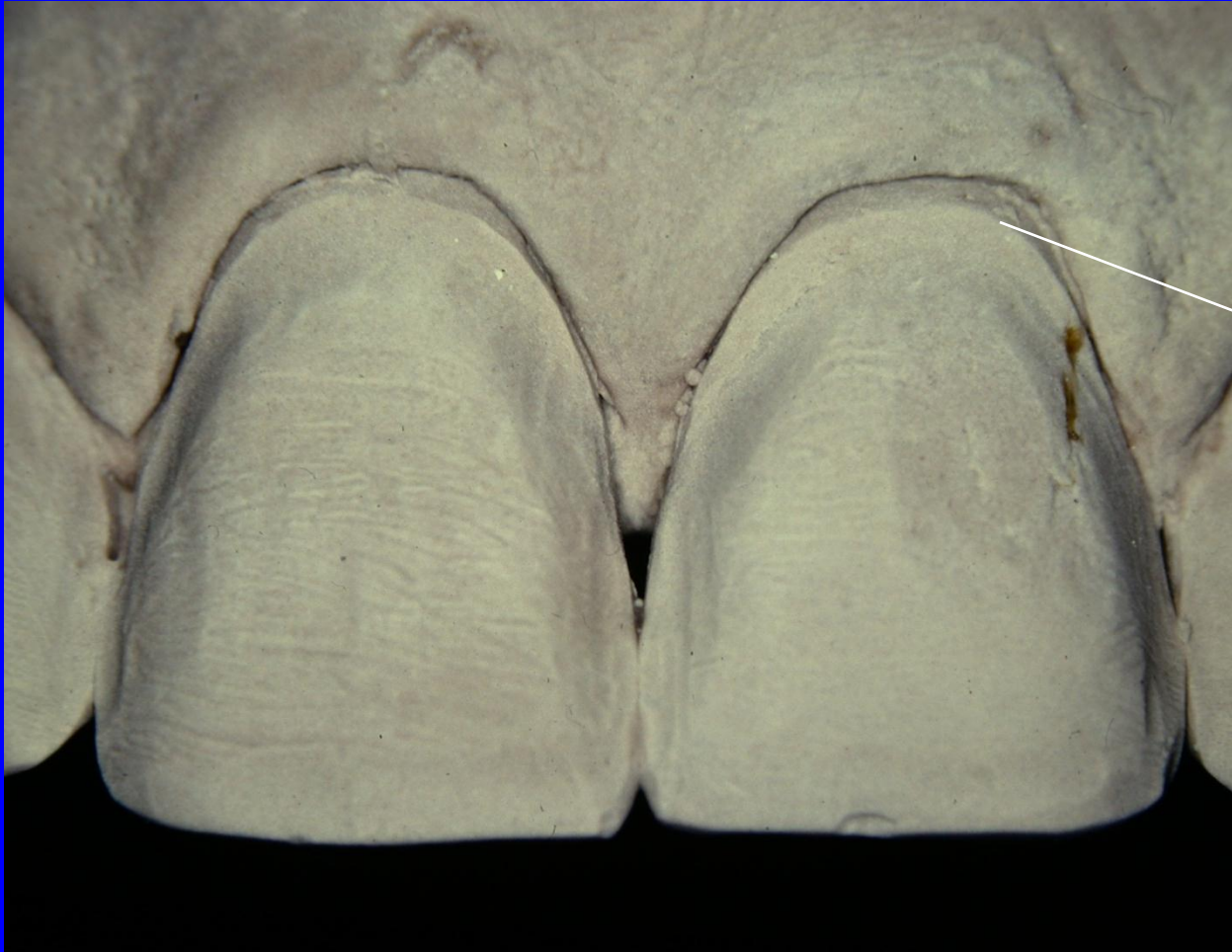
# **Tooth Preparation For ceramic Laminate Veneers**

# **Types of preparation**









Margins are not  
high enough –  
discolored tooth  
will be obvious

Why preserve the  
contact area?

- It is an **anatomical feature** that is extremely **difficult** to reproduce.
- It prevent **displacement** of the tooth between **preparation and placement** sessions.
- It saves **clinical adjustment** of contact area in **fine ceramics**.
- It **simplifies bonding** and finishing procedures.



- It simplifies **try in** procedure and prevent their fracture.

When not preserve the  
contact area?

1. In cases where proximal contact is lost
  - Multiple spacing.
  - Diastema.
  - Proximal restorations.
  - Broken angles.
  - Malpositions.
2. In cases of multiple laminates ( to facilitate separation of the dies without damaging the inter-proximal finish line).



**Depth grooves created**







**Enamel between grooves removed**

A close-up photograph of three teeth. The central tooth is the primary focus and shows a distinct, flat, and somewhat irregular surface between its proximal grooves, indicating that the enamel in this area has been removed. The teeth on either side appear smoother and more natural. The background is a solid blue color, and the teeth are resting on a reddish-orange surface.



**Incisal reduction for type II prep**

A close-up photograph of a dental model showing three teeth. The central tooth is a maxillary incisor with a significant portion of its incisal edge and upper enamel surface removed, revealing the underlying dentin. This preparation is characteristic of a type II prep for a veneer. The adjacent teeth on either side are intact and show a natural, glossy enamel surface. The entire model is mounted on a solid orange base.





A close-up clinical photograph of a maxillary premolar tooth undergoing preparation. The tooth is mounted on a red wax block. The preparation involves a proximal reduction, which is a bevel cut on the proximal surface of the tooth. The reduction is visible as a smooth, slightly translucent, and slightly discolored area on the proximal surface. The text overlay indicates that the reduction is 'just short of breaking the contact'.

**Proximal reduction just short of**  
**breaking the contact**

# Provisional restoration

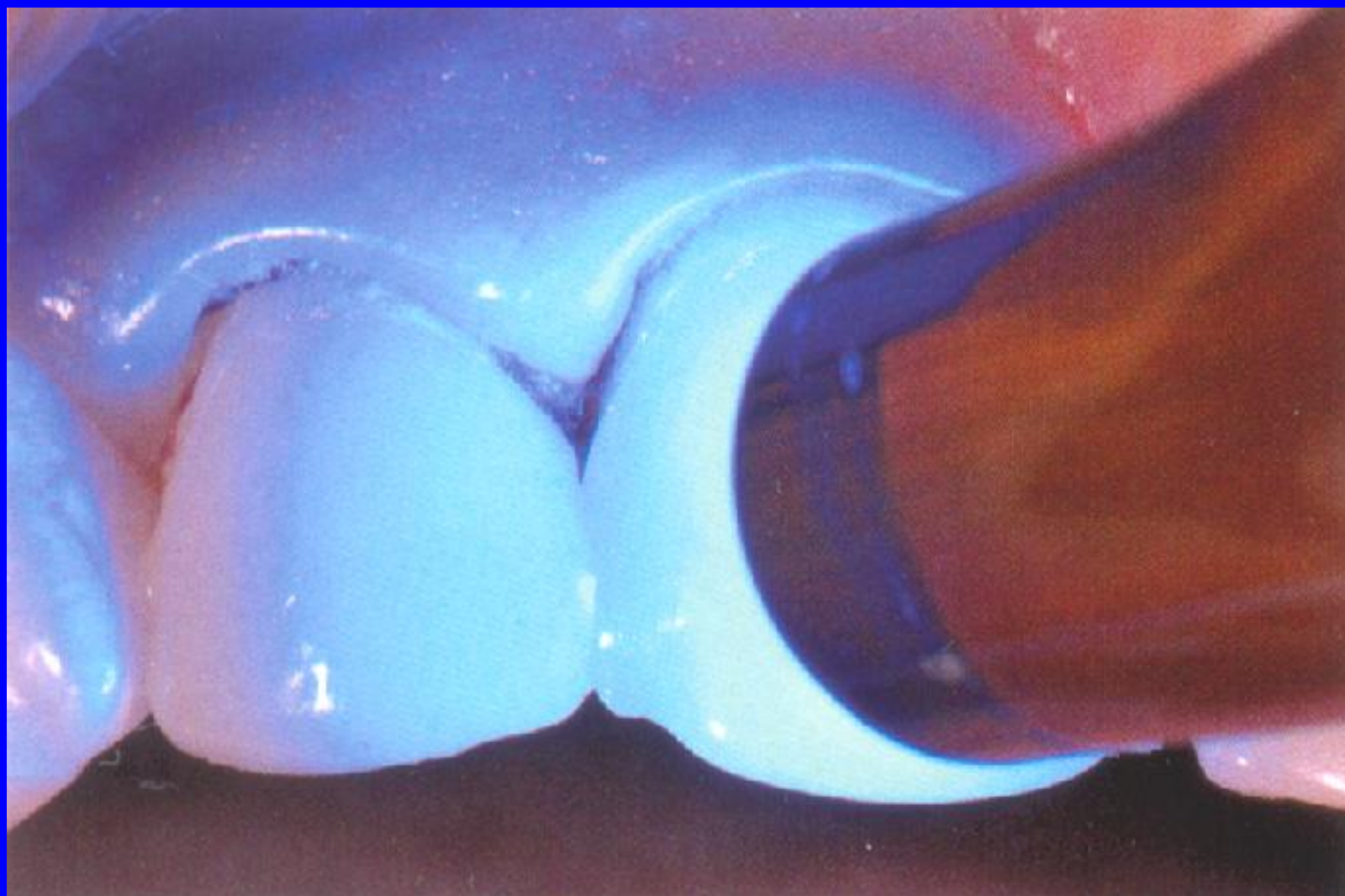


# Direct technique

- **Composite resins** are generally used and are only applied to a single preparation at a time.
- The tooth has to be coated with a layer of **water-soluble separator**.











**Finished & cemented**

Indirect technique:

It is suitable when a group of several laminates  
are to be constructed.



# Material used

- Acrylic resin
  - 1-plymethyl methacrylate
  - 2-ethymethymetahcrylate
- Bis acryl ( composite)



**Transparent plastic mold**



**Loaded with resin**



**Light cured**





**Trimmed and adjusted**





**Cemented**

What are Lumineers porcelain  
veneers?

- Lumineers porcelain veneers are a **readymade veneers** made out of the **patented porcelain Cerinate**.
- It is highly dense leucite reinforced press able ceramic 1 um sized Lucite crystal but detailed composition is considered confidential by denmat company usa

- The **thickness** of Lumineers veneers can be as little as **0.2 to 0.3** In comparison **traditional porcelain** veneers typically require a minimal thickness of around **0.5 mm**.



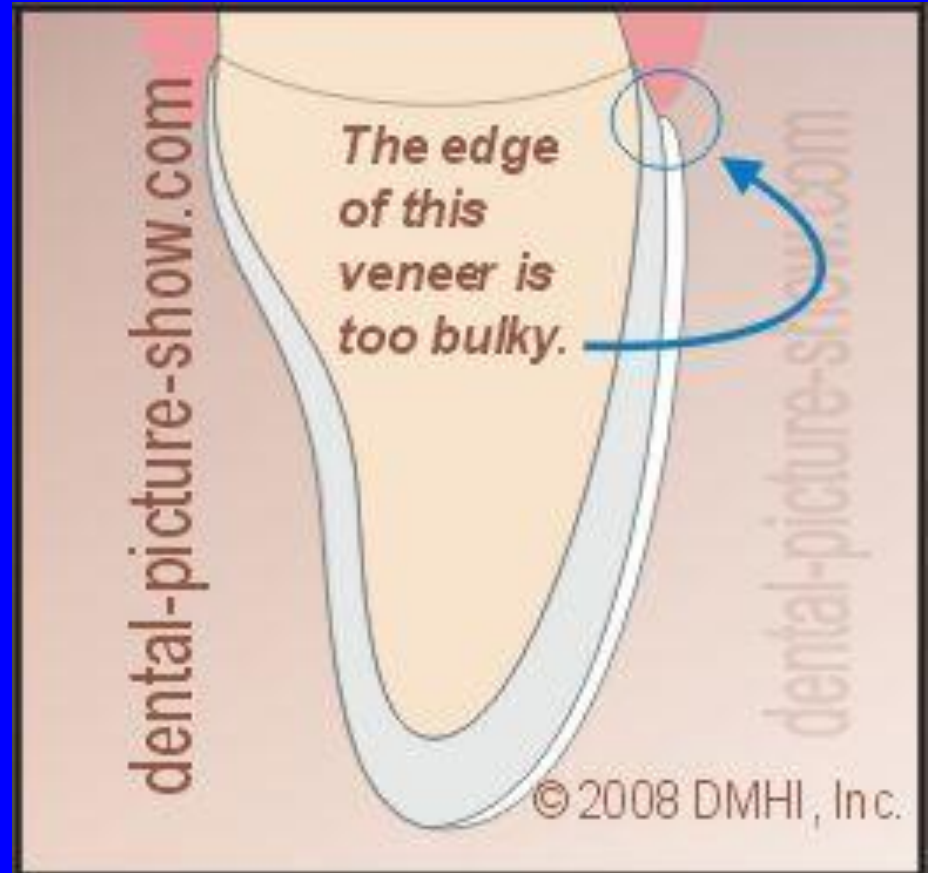


# Advantages

- No drill
- Thin

# Disadvantages

- A) Lumineers don't always appear as life like as traditional porcelain veneers.
- B) It's easy for Lumineers cases to create teeth that are over

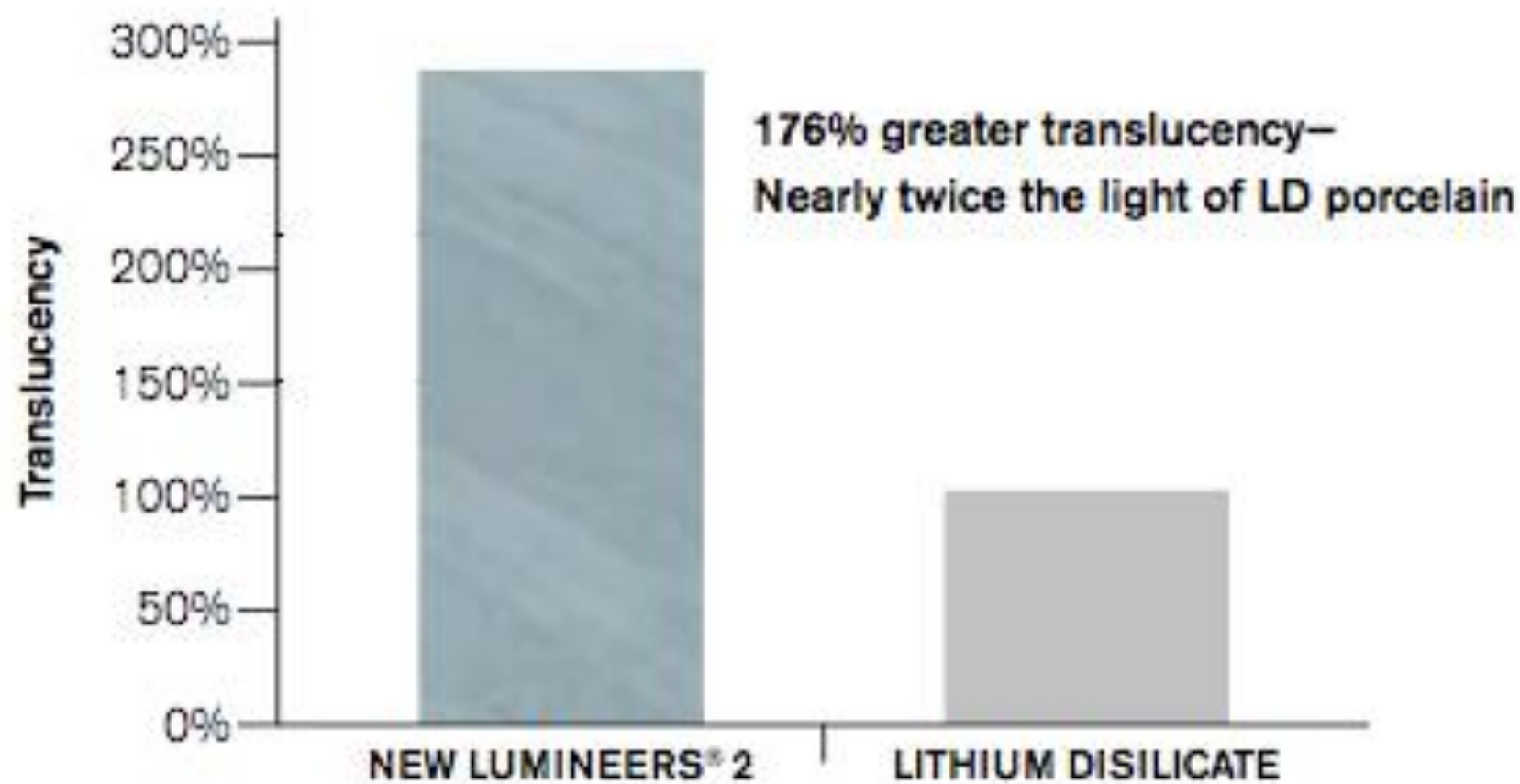


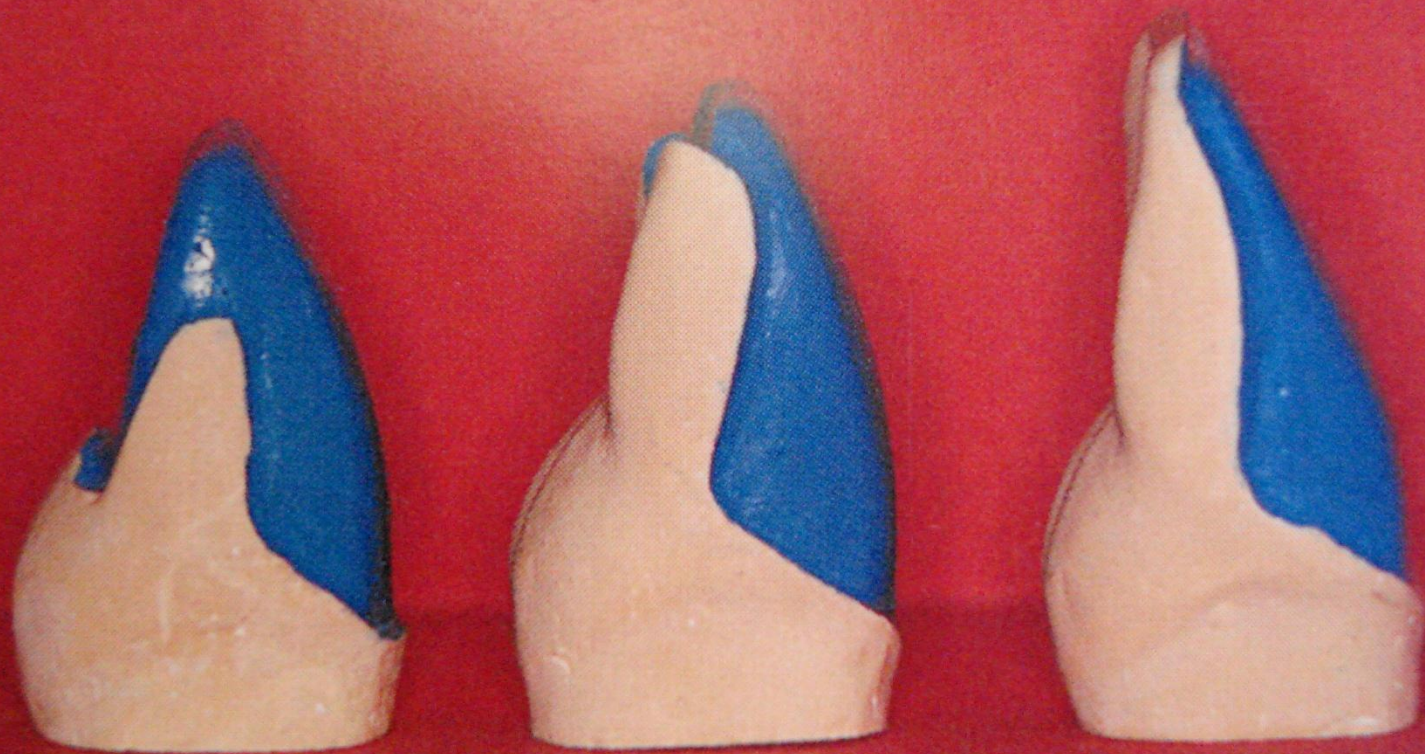
 Tooth decay.

 Expensive

 Poor fit

between teeth  
and laminates









## ● Facial reduction

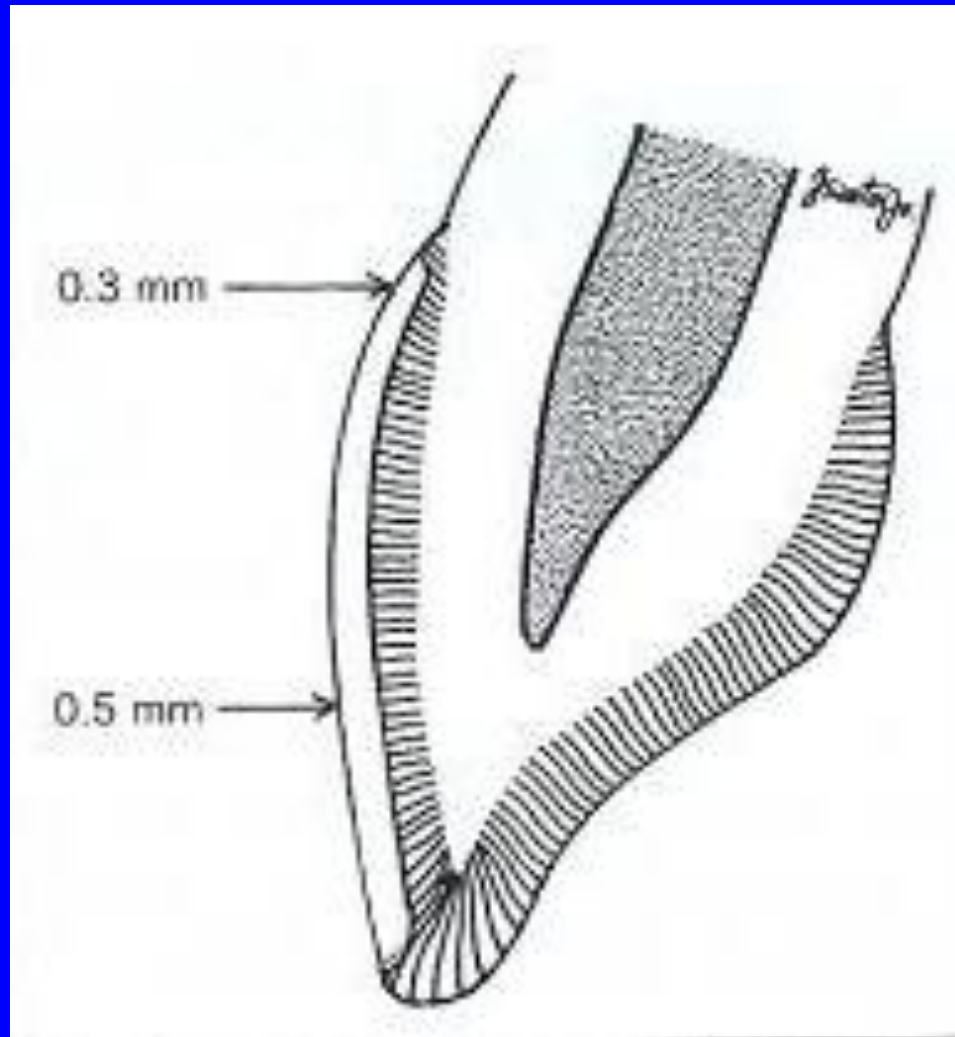
- Gingival third : **0.3 – 0.5 mm**

- Middle & Incisal : **0.5 - 0.8 mm**

- Incisal reduction **1– 1.5 mm** (For type II & III prep)

- Lingual reduction **0.5– 0.7 mm** (For type III prep)

# Window preparation



Preparation :

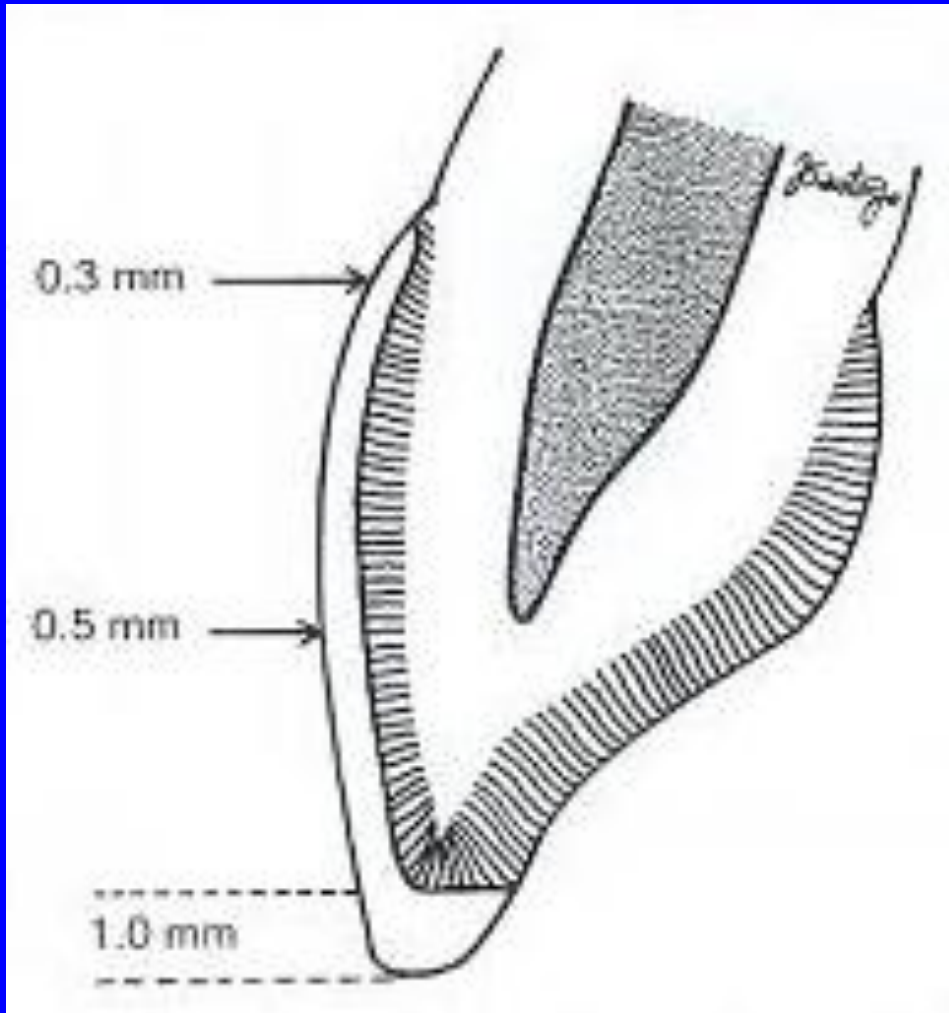
- Only vestibular surface prepared
- Nor incisal , neither oral!

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Schwartz R.S., Summitt J. B., Robbins J. W., Santos J.: Fundamentals of Operative Dentistry, Quintessence, 1996



# Standard veneer preparation



Preparation :

- Vestibular surface
- 1mm incisal reduction



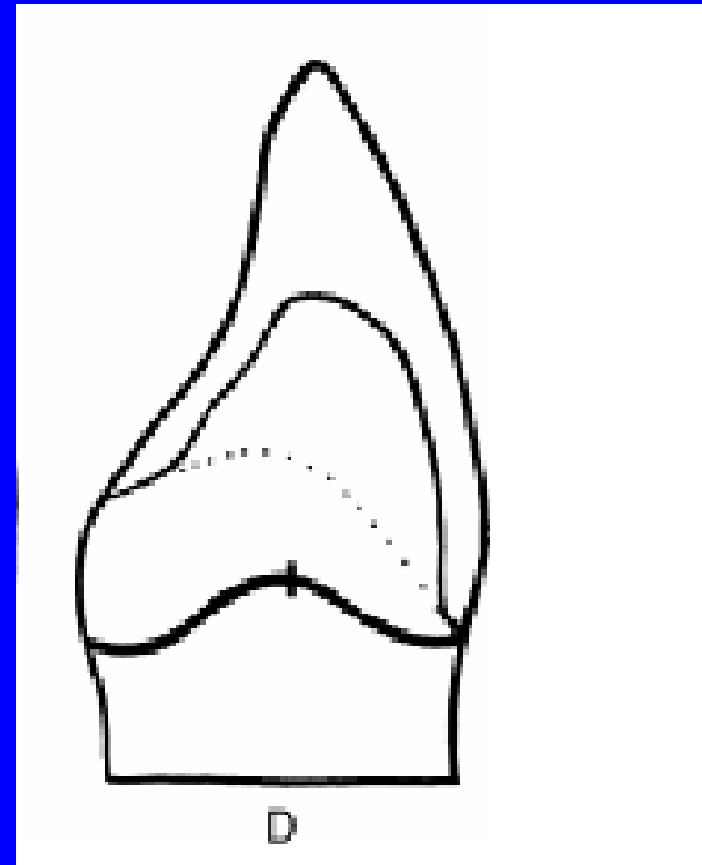
Dr.Tamer A. Hamza



# Complete veneer preparation

- Including a 3-mm incisal reduction and a 2-mm wide palatal chamfer

- 



# PORCELAIN VENEERS

## tooth preparation

- Most in enamel
- 0.3-0.5 mm deep (0.7 for deep stain)
- depth cuts with a round-end diamond
- facial margin at gingival crest or slightly sub-  
gingival
- Due to thin enamel the gingival margin of  
mandibular anterior veneers may have to be  
supra-gingival

# PORCELAIN VENEERS

incisal edge

- on mandibular incisors the incisal edge should be reduced
- incisal reduction should be uniform (horizontally) for more uniform esthetics

# PREVIOUS RESTORATIONS

What to do with them??

Old restorations should be replaced with fresh composite resin the day the veneer preparations are done.

Resin cement will not bond to old, contaminated restorations.

# PORCELAIN VENEERS

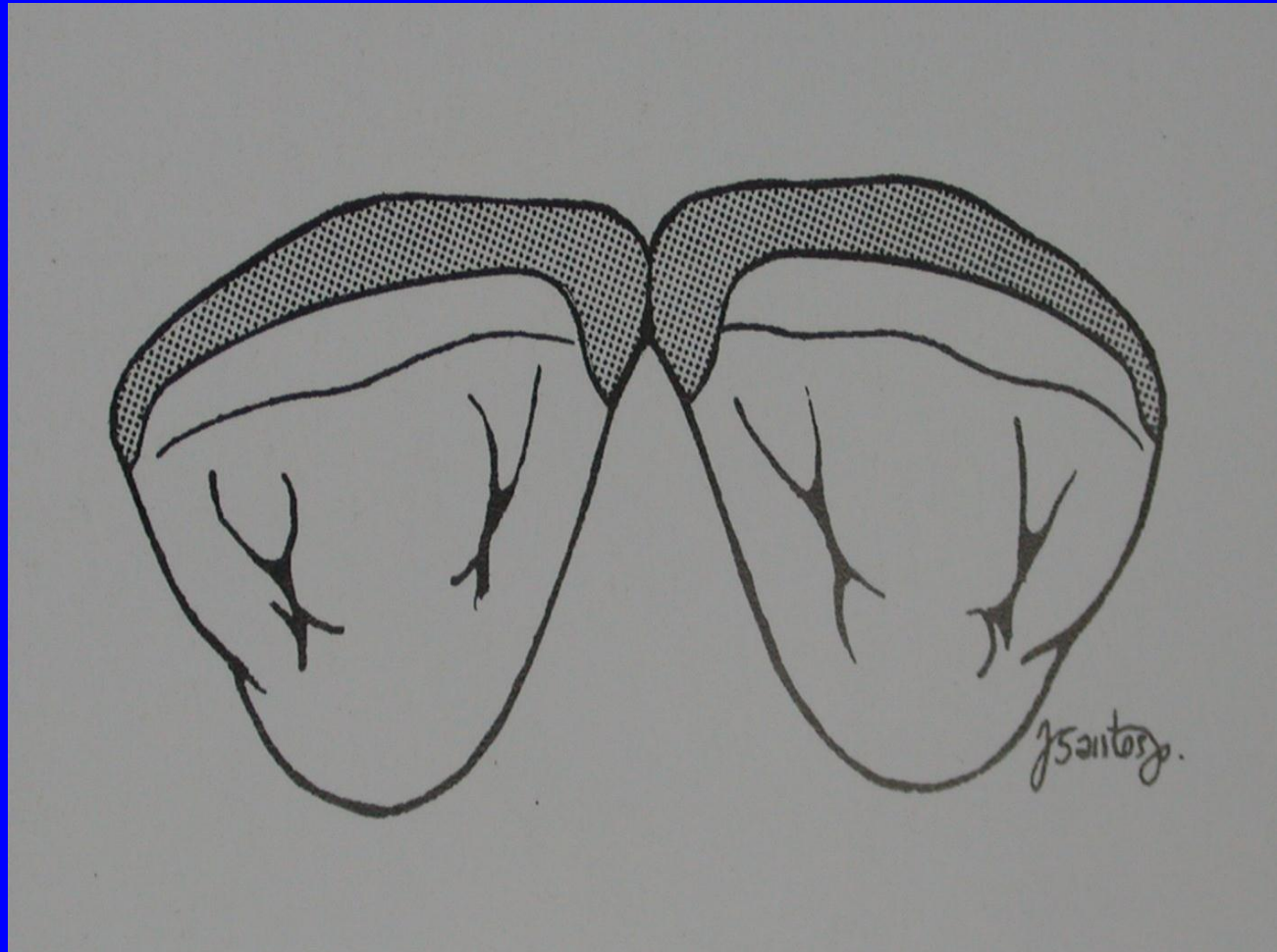
fractured incisal edges

- Up to 50% of a tooth can be replaced with a porcelain veneer when the preparation on the remaining tooth structure is in enamel
- both facial and lingual surfaces are covered (“V” veneer)

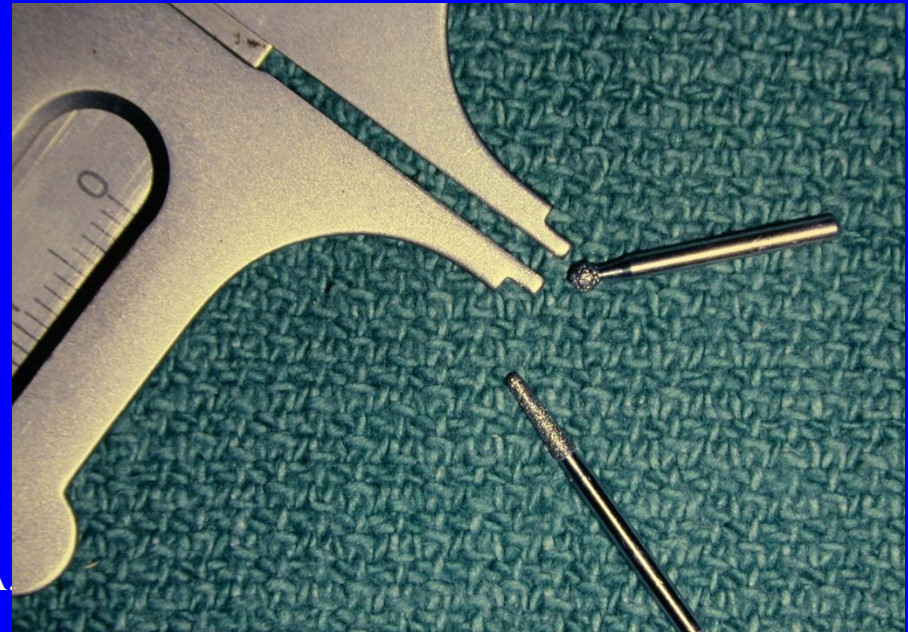
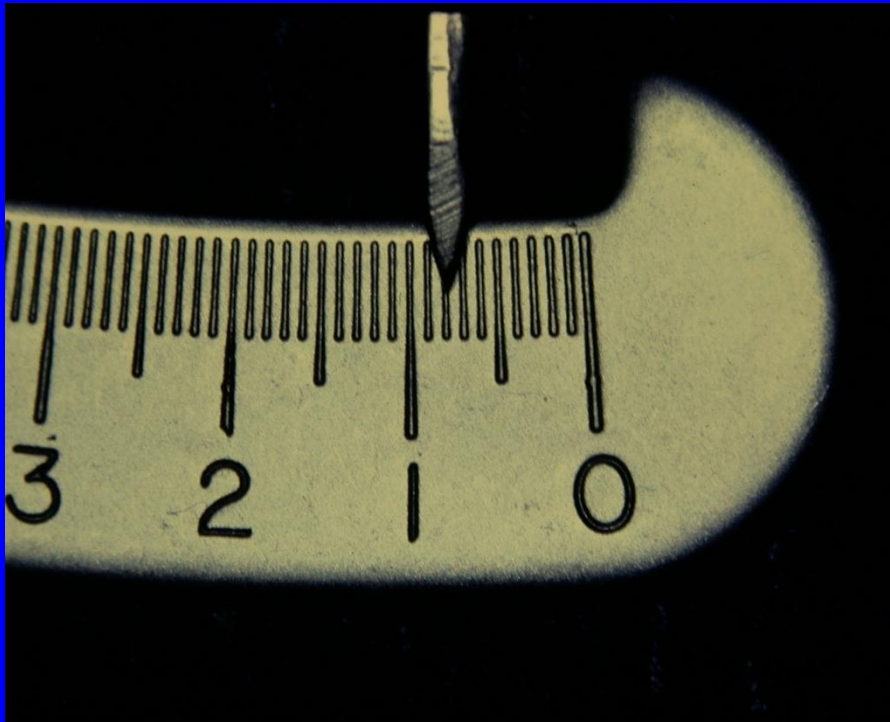


# Proximal extension

Porcelain  
veneer prep.  
includes  
contact area  
if closing a  
diastema

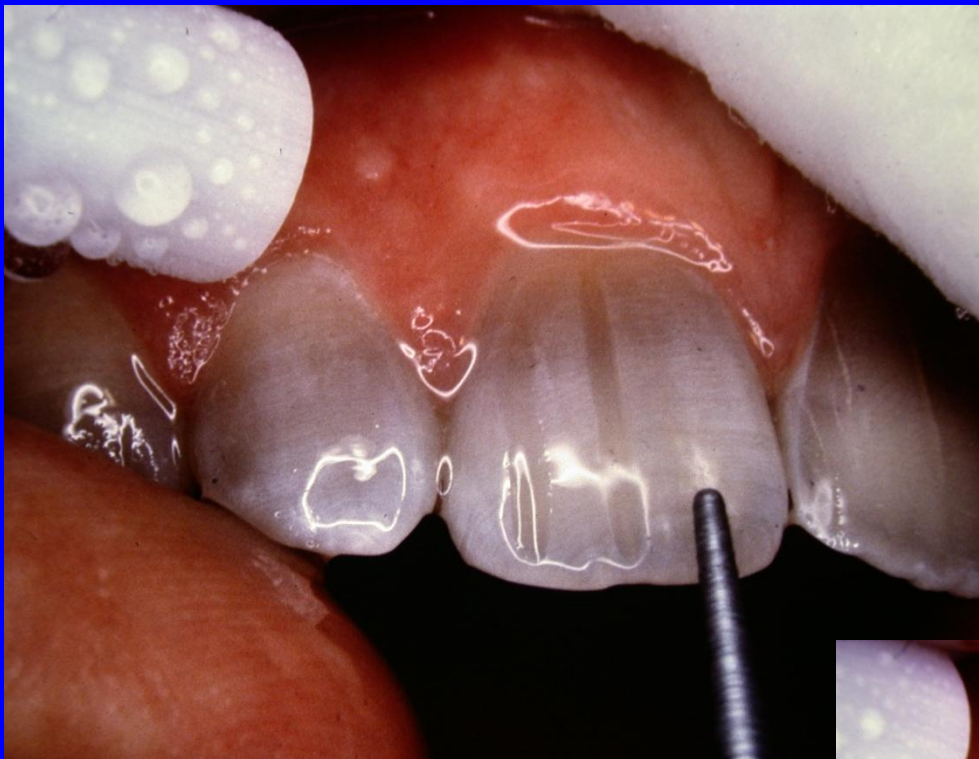


Enamel reduction is  
approximately  
0.4 – 0.6 mm, required for  
both strength and esthetics

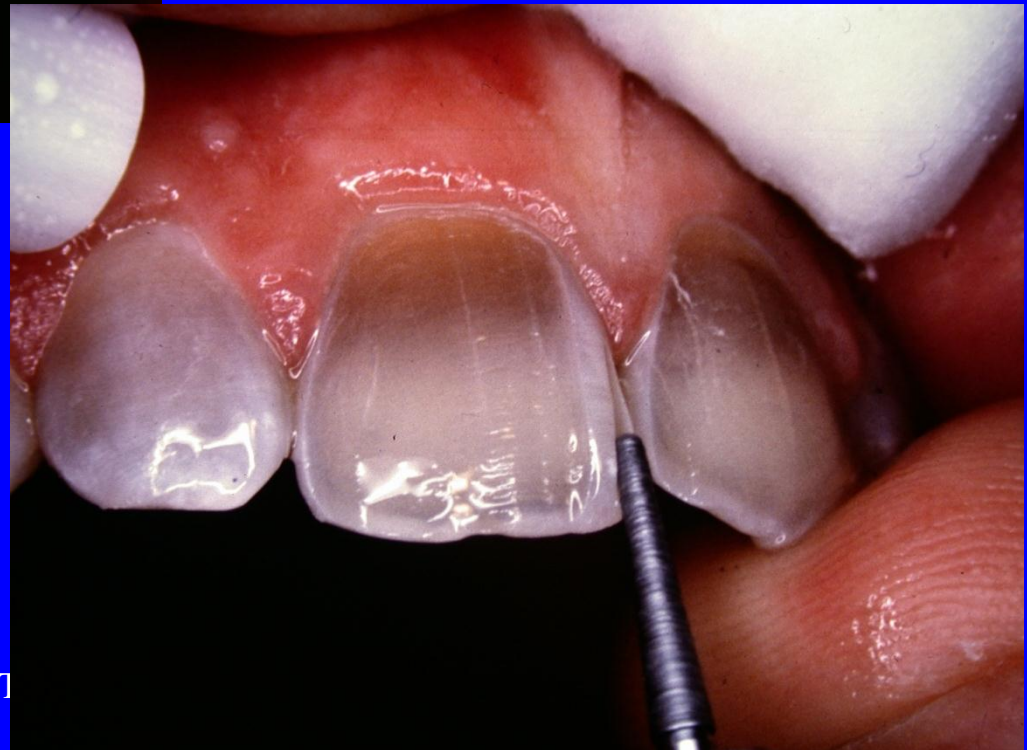




## DEPTH GROOVES



Used for proper control of enamel reduction and uniformity of reduction

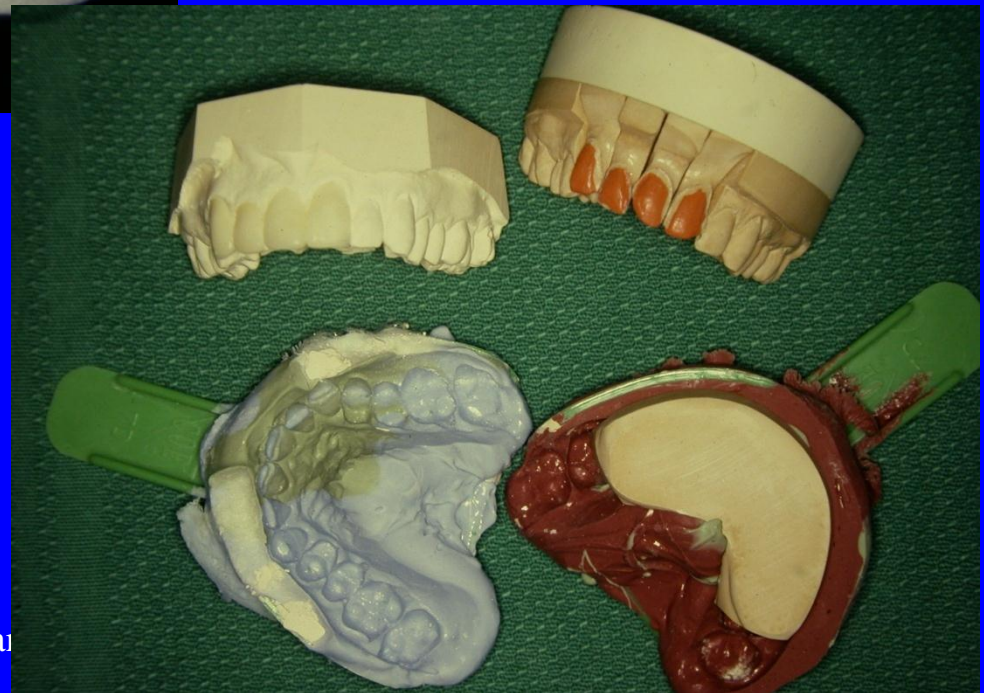




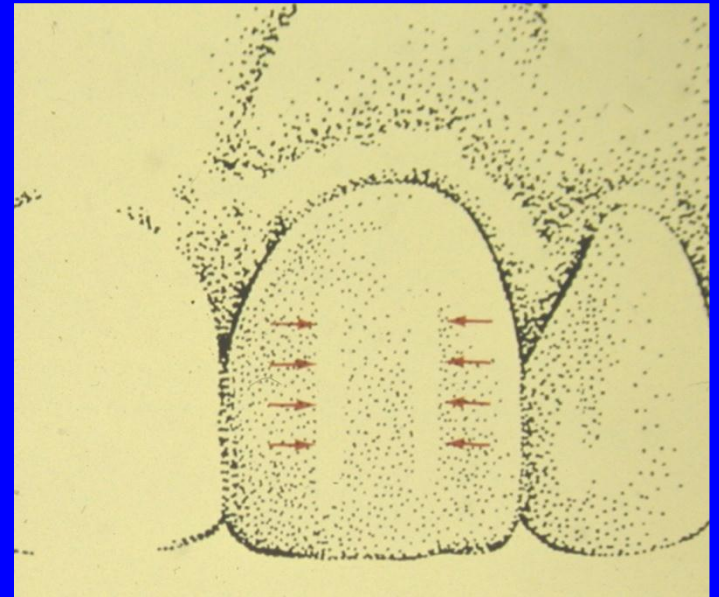
Acceptable preps except  
for position of margin

Margins are not high  
enough – discolored tooth  
will be obvious

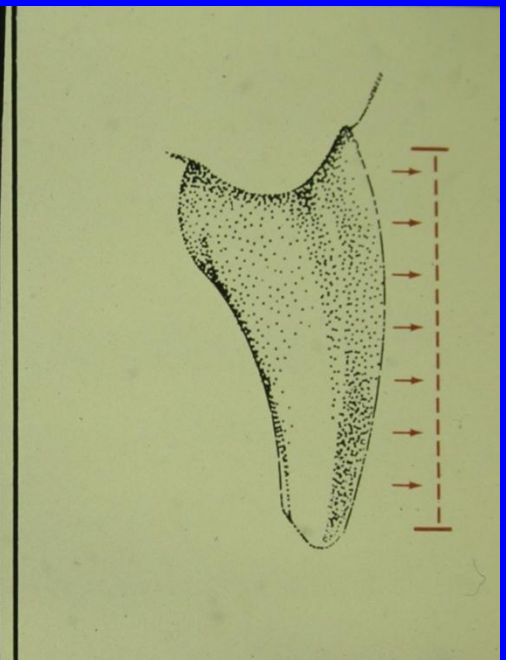
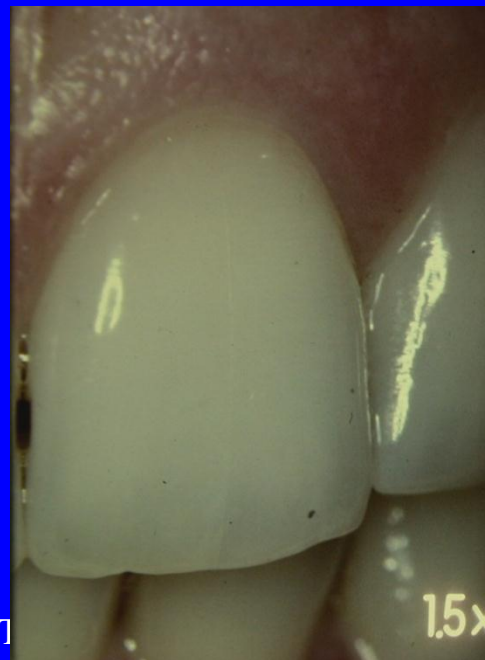
Final PVS impression,  
poured model/dies,  
study model





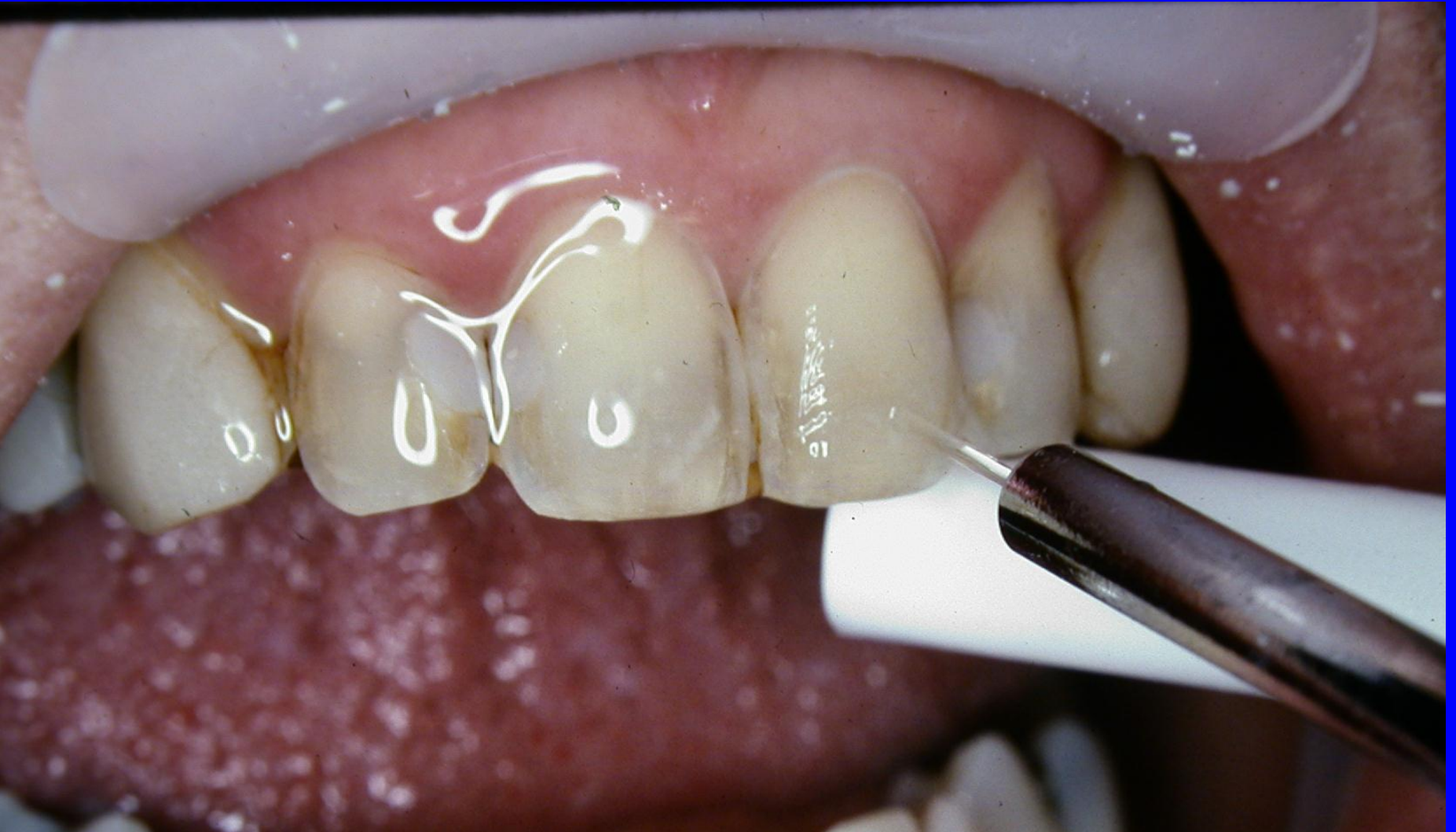


Facial contours are very important for the esthetic success of a veneer





# Cementation of Porcelain Veneers



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First try-in each veneer separately

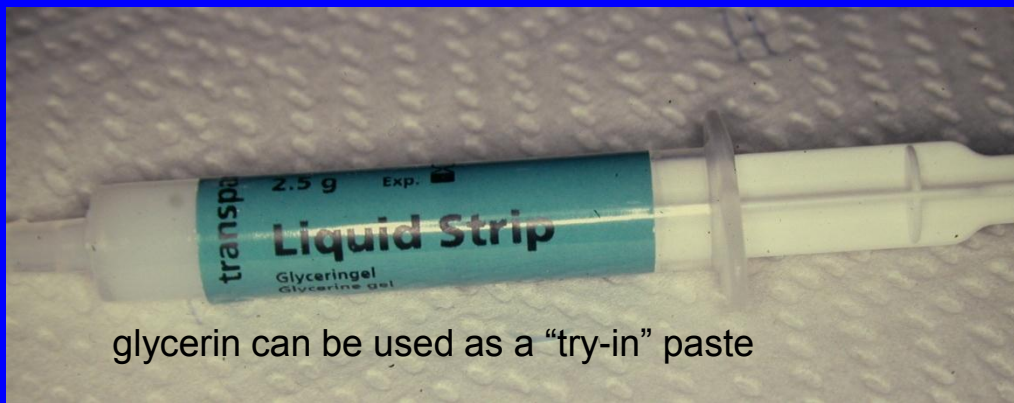
Then all together to evaluate contacts and determine sequence of cementation





Place all veneers with water, glycerine, or try-in paste, to check for color





glycerin can be used as a “try-in” paste



try-in paste



3 3



Try-in paste colours

2

If a “try-in paste” is used the paste is wiped off with alcohol on a “Q”-tip



8% HF acid will etch porcelain



Fresh silane (ceramic primer) will increase bond strength 30-50%





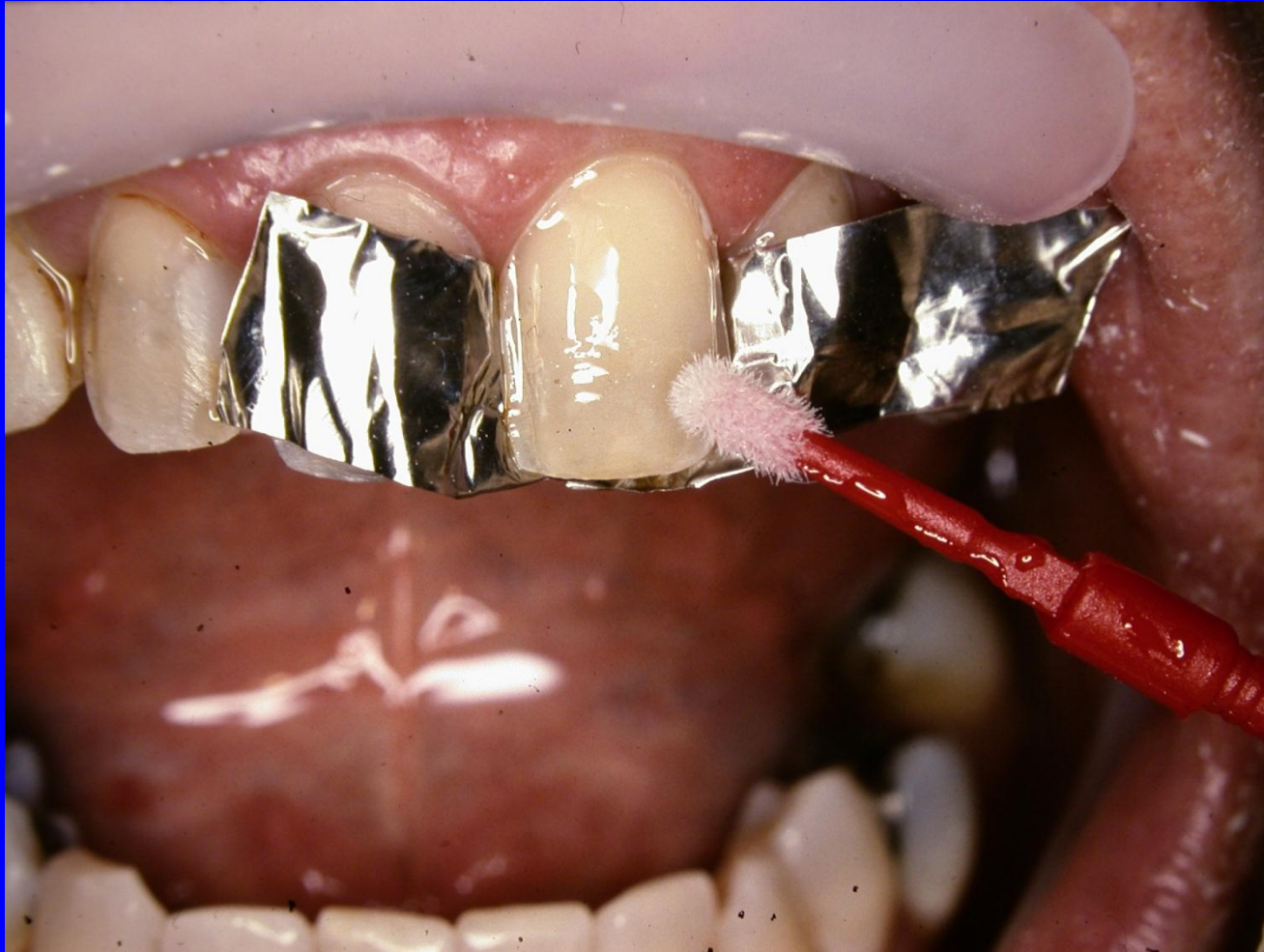


“dead soft” matrix strip  
can be bent back out  
of the way during  
cementation



Place “dead soft” matrix material, acid etch, rinse

Apply bond resin to tooth, cure



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Apply cement to veneer



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Carry veneer to mouth



...and carefully seat







Light-cure 40 seconds



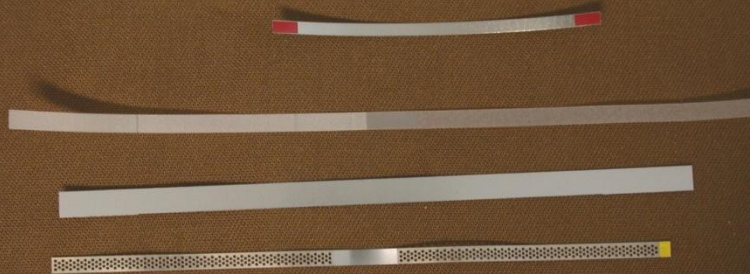
Finished case

“dead-soft” matrix material used to prevent bonding to adjacent teeth

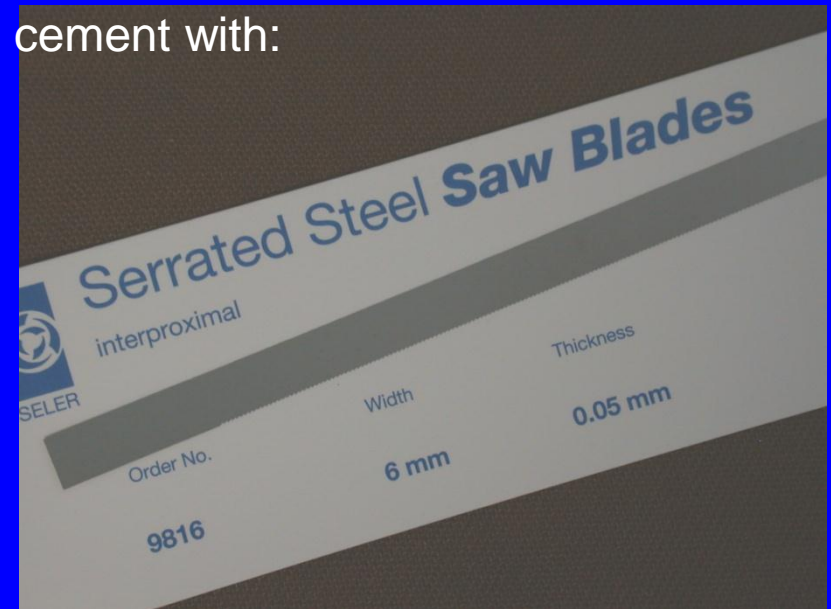


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Remove excess reinforcement with:



Matrix strips – celluloid-backed  
and metal



ET (extra thin) Softflex discs

Ceri-saw

# INSTRUCTIONS TO PATIENT

- no biting on hard objects (candy, pencils, finger nails)
- inform patient composite resin cement will wear at margins and need repair from time to time
- veneers will not bleach (mention when shade is selected)
- no acid fluoride treatments (acidulated phosphate fluoride)
- also advise the patient if the soft tissue recedes margins will be exposed

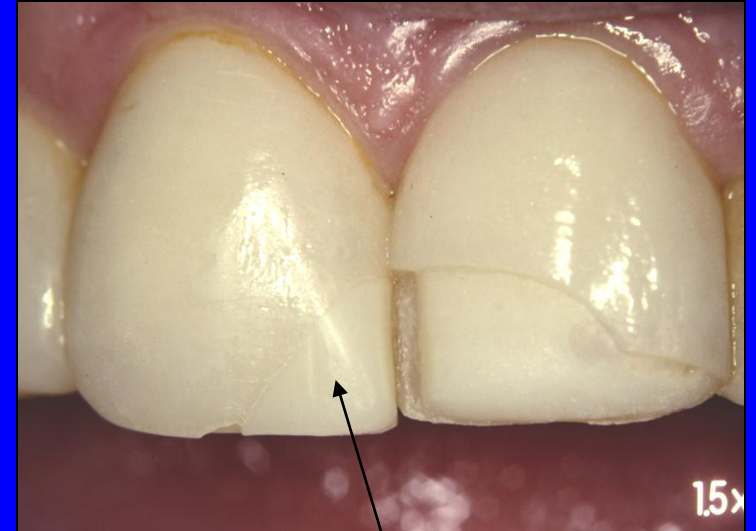
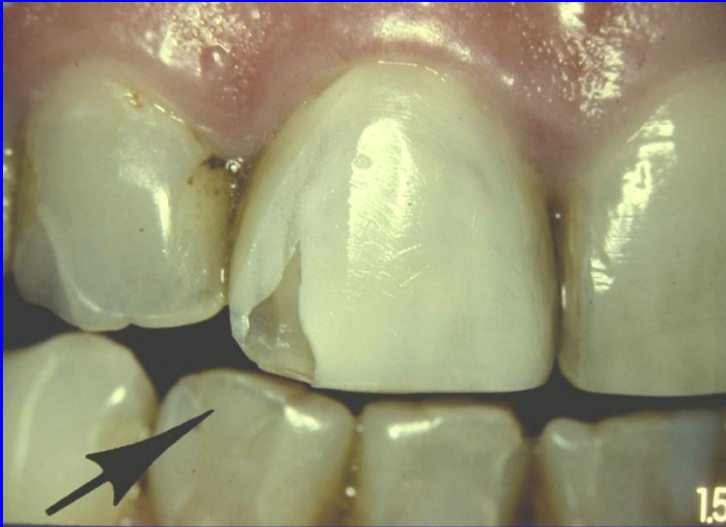
# PORCELAIN VENEERS

## failure

- between resin and veneer is likely due to poor etch of veneer or old silane
- between tooth and resin the problem is bonding materials, placement technique, bonding substrate



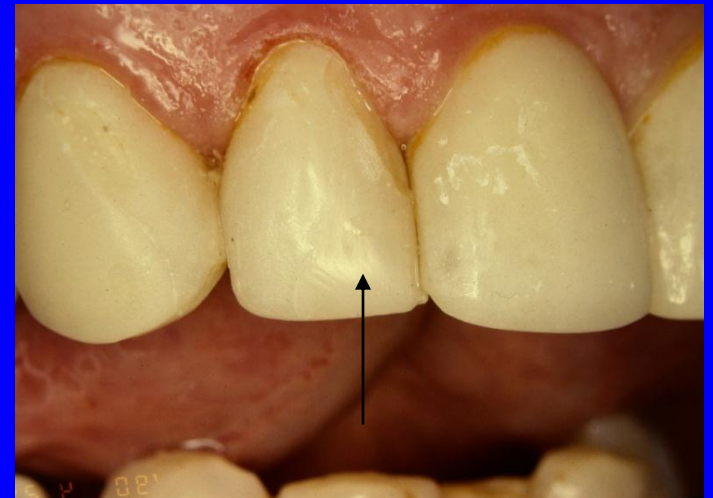
# PORCELAIN FRACTURES



Porcelain veneer repairs are done using AE/BOND/CR; however, they do not last long



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# PORCELAIN VENEERS

## maintenance veneers

- no heavy abrasives – use aluminum oxide pastes or diamond pastes when cleaning
- watch scalers around margins
- no ultrasonic cleaners/scalers
- no air-abrasive polishers
- no pumice, regular prophylaxis paste OK
- no acidulated phosphate or stannous fluoride

# Resin bonded restoration



Dr.Tamer A. Hamza

- A minimal preparation bridge, and considered as an example for conservatism.
- It can be either of metal or metal-free (In-Ceram or FRC)

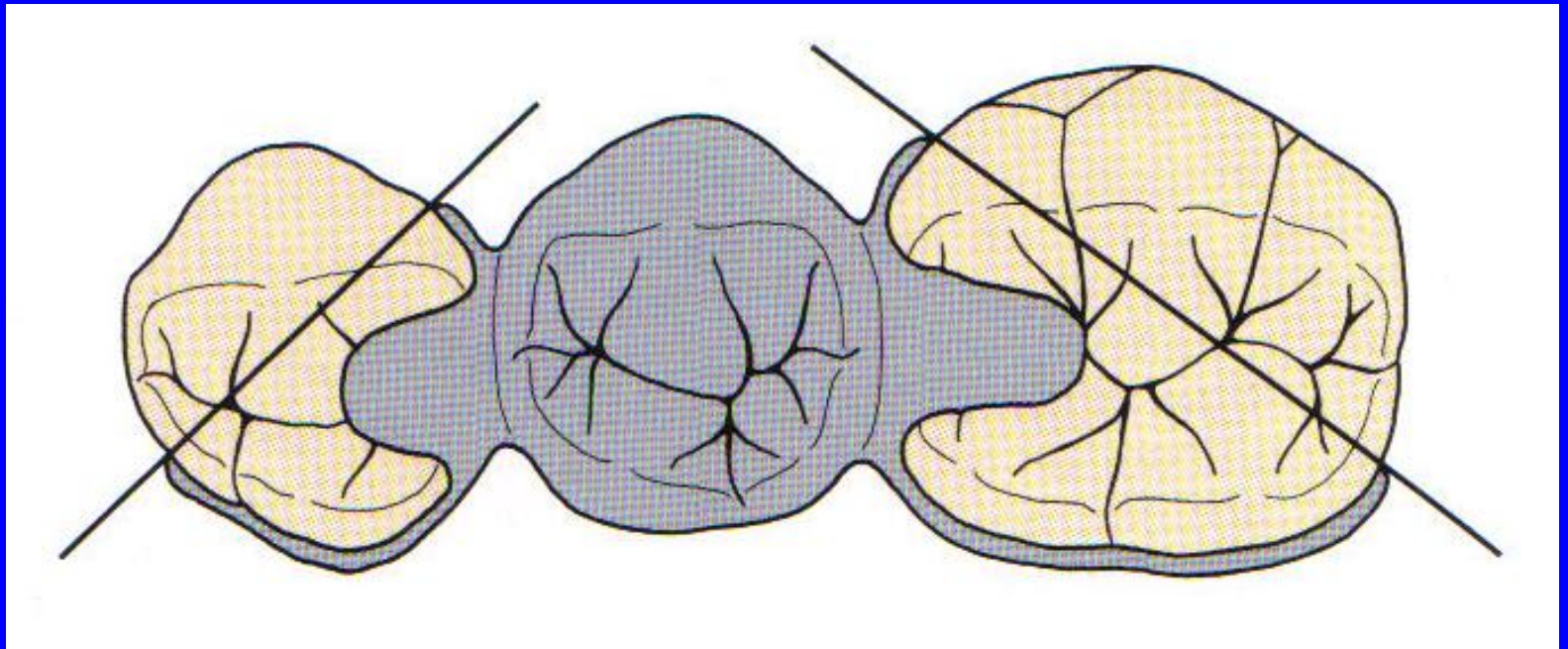






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# Posterior teeth



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# Indications

- 1-Young age
- 2-Tooth with good enamel for bonding
- 3-Good size abutment
- 4-Good stable occlusion
- 5- short span

# Contraindication

- 1-Lack of sufficient enamel
- 2-Very thin anterior teeth
- 3-Need for complete coverage of the abutment
- 4-Short clinical crown
- 5-Long edentulous space
- 6-Deep bite

# advantage

- 1-Preservation of tooth structure
- 2-Tissue tolerant
- 3-Esthetic advantage
- 4-Simple impression because supra gingival margin
- 5-Cost effective
- 6-No need for temporary coverage
- 7-Less chair time

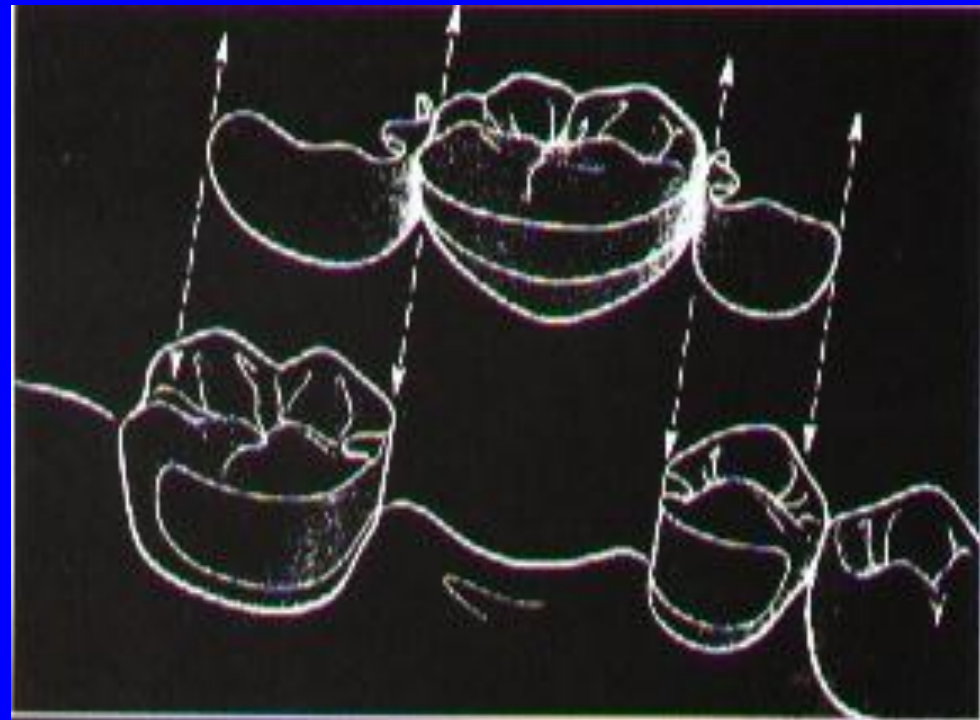


# Disadvantage

- 1-The longevity of the bridge is questionable
- 2-Cannot be used with broken tooth
- 3-Grayish discoloration due to metal
- 4-Space correction is difficult
- 5-Single tooth replacement

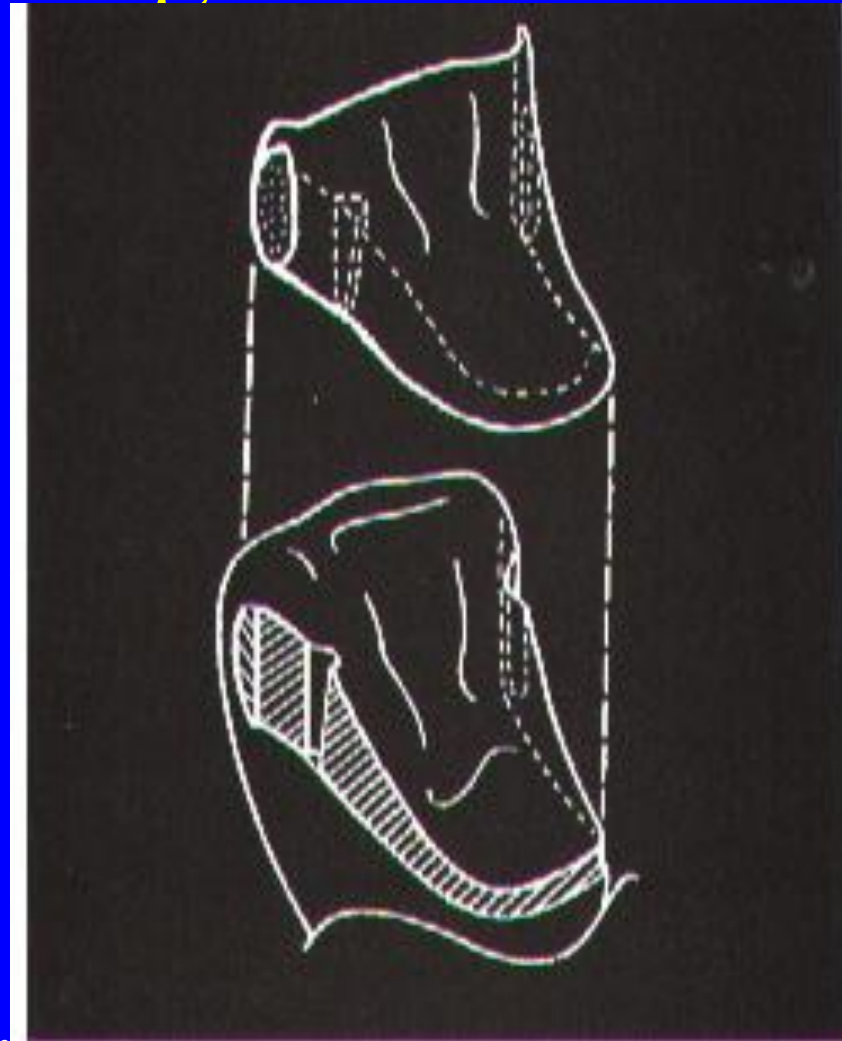
# Framework design

- Posterior design
  - 1-creating a distinct path of insertion
  - 2-maximum coverage of enamel it should extend beyond the mesiobuccal and distobuccal line angle(180)
  - 3-occlusal rests
  - 4-proximal grooves



# Anterior design

- 1-sufficient lingual surface clearance
- 2-proximal groove
- 3-proximal labial extension without metal display
- 4- cingulum rest



# Bonded Pontic

- Extracted natural tooth or acrylic pontic bonded with composite resin directly to proximal and lingual surfaces of abutment teeth.
- Have limited lifetime
- Short-term replacement



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# Bonding of resin retained restoration

- Mechanical bonding
- Chemical bonding

# macromechanical method

# 1-cast perforated resin retained bridge (rochette)



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## *Disadvantages :*

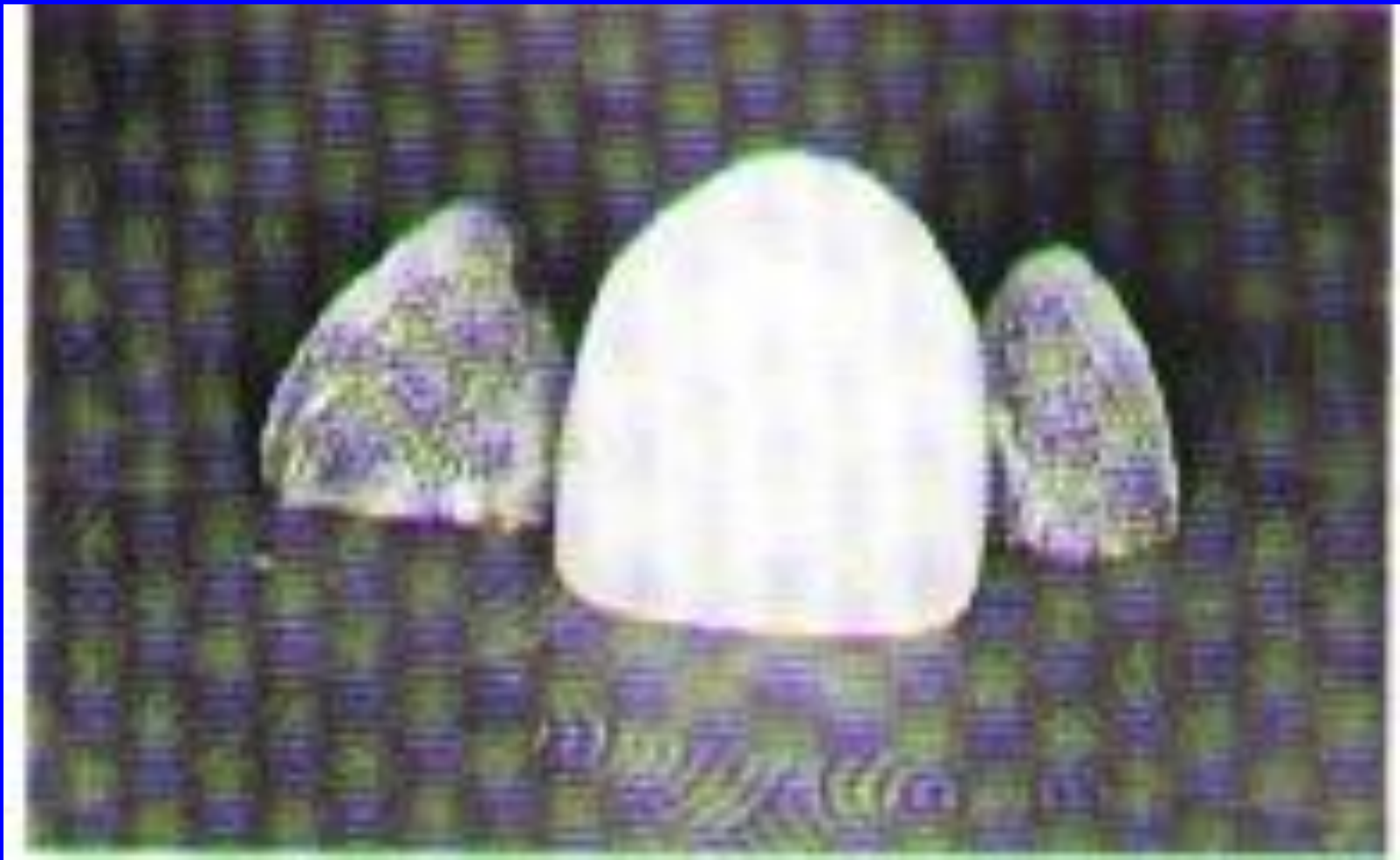
- Metal is weakened by these perforations.
- Stress concentration at the perforated alloy resin interface
- Wear of resin at the perforation sites.
- Mechanical retention is limited only to the perforated areas.



2-water soluble salt crystals (virgina bridge)

3-cast mesh pattern on the internal surface of the  
retainer

4- acrylic beads on the wax pattern



# Micromechanical bonding

# Surface treatment of completed restoration

## **1-electrolytic etching**

Used with non precious alloy

nickel chromium with beryllium -----sulphuric acid nickel chromium no beryllium ---nitric acid

3min with 300 milampere

## **2-chemical etching**

(nitric acid and hcl) for 25 min at room temperature

Used with non precious alloy

## **3-sandblasting**

250 micron al203 for 30 sec then washed in ultrasonic for 10 min

# Tin plating

A very thin layer of tin is formed on the fitting surface (0.2-0.4 $\mu\text{m}$ )

- It's for **precious** alloys
- Cements bond to the oxide-layer formed on the tin-plated surface.

# Silicoater technique:

It includes application of silica-carbon layer to the metal surface

Then this treated surface is silane coated.  
It's applied to both **precious** and **non-precious** alloys



# Rocatec system (Tribochemical coating)

In this method, the metal surface:

- Is initially particle-abraded with 120 um alumina.
- Followed by abrasion with a special silicate particle-containing alumina → deposits a molecular coating of silica and alumina on the alloy surface.
- Silane is then applied to the surface, for adhesion to composite resin.

# . Heating the alloy

- It is indicated for **precious** alloys only.
- Cu. deposits are formed on the alloy surface by heating.
- A strong bond occurs between the Cu deposits and 4-META adhesive resin cement.

- *Single heating:*

Gold alloy heated in the furnace at 400°C → 3:5 min. when the color of the metal surface turns blue,

the alloy is removed and left to cool to room temp.

- *Double heating:*

Alloy is heated at 800°C for 1hr. Then washed in acidic soln. to remove oxidation film.

The alloy is again heated at 650°C for 10-20 min. till it's color is light grey then left to cool.

## 2-Immersion in conc.HNO<sub>3</sub>

### 2-Immersion in conc.HNO<sub>3</sub>

- It's for non-precious alloys only.
- It produces a thin film of oxide to which 4-META adheres strongly

# Surface treatment of tooth structure.

- **1- Acid-etch technique:**

Tooth is cleaned, washed and dried.

35%  $\text{H}_3\text{PO}_4$  is applied to E. for 60 sec.

tooth is washed for 30 sec. then dried→ frosty appearance.



- **2- Laser etching:**

A minimal amount of laser initiator is applied to the prepared area

The surface is then etched by laser for 60 sec.

The surface is now ready for bonding.